December
1960

COMMERCIAL FERTILIZER

and PLANT FOOD INDUSTRY

We wish you a

Merry Christmas

and a

Prosperous 1961

Allied Chemical

NITROGEN DIVISION
40 Rector Street, New York 6, N. Y.

sleek...
trim...
and perfectly coordinated!

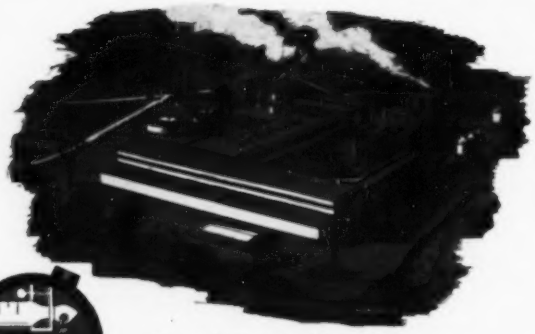
That's our new 300,000 sq. ft. multiwall bag plant at St. Marys, Ga.

Like the building itself, our equipment is new and the very latest in mechanical efficiency.

This fully integrated plant has every facility for turning out every kind of multiwall bag ... open mouth or valve, sewn or pasted, stepped-end, and our own patented Kraft-lok® valve; also bags with special inserts, sleeves, protective linings or outers, and vapor barriers.

The best in multiwall bags—are Kraft Bags!

... and the best in open mouth bag filling machines is The Kraftpacker, for which we are exclusive sales agents.



Paper Mill at St. Marys, Ga.

KRAFT BAG CORPORATION
Gilman Paper Company Subsidiary
630 Fifth Avenue, New York 20, N. Y.
Daily News Building, Chicago 6, Ill.

☐ We would like to know more about Kraft Bag Multiwalls.
☐ We would like to know more about The Kraftpacker.

COMPANY NAME _____
ADDRESS _____
CITY _____ ZONE ____ STATE _____
PRINCIPAL _____
PRODUCT MFD _____ CF

NEW STEDMAN BATCH MIXER

Lower Cost Per Ton

- Trunnions—Special Neothane tires on heavy duty flanged wheels, roller bearings. Interlocked—4 wheel drive.
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- Discharge hood—Extending to floor, as standard equipment.
- Bumper attachment—steel roll type, as standard equipment.
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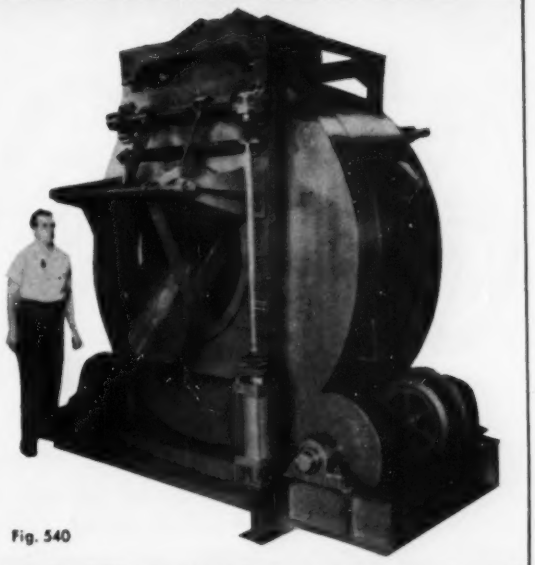

Fig. 540

4-WHEEL DRIVE RUBBER-TIRED TRUNNIONS

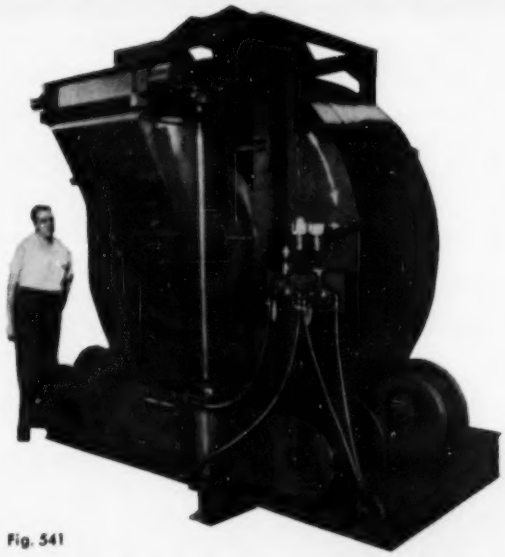

Fig. 541

Lower Initial Cost

- Shell vibration and chatter (due to gear and pinion drives) are gone forever.
- Tires, ring gear, pinion, pinion shaft and bearings are *completely eliminated.*
- Maintenance greatly reduced—virtually *no* spare parts to stock.
- Streamline design reduces overall weight and floor space required, and at the same time provides a more rugged machine.

MODEL	SHELL SIZE DIA.	SHELL SIZE WIDTH	MIXING CAPACITY CU. FT.	APPROX. WEIGHT
1 Ton	6'6"	2'6"	35.4	7000
1½ Ton	7'3"	3'0"	49.5	10200
2 Ton	8'0"	3'4"	65.3	12600
3 Ton	9'0"	3'10"	97.5	14000

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Subsidiary of United Engineering and Foundry Company
General Office & Works: AURORA INDIANA

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But that's only a little of the story, really. The phrase "controlled granulation" means what it says, all the way. The granules come through uniform—on 6 and through 16 mesh screen. The plant performs up to capacity, and keeps on doing so because Weatherly designed equipment is tough and takes a lot of punishment.

And Weatherly construction comes through on time, with the plant you were promised, operating smoothly — and with your people fully trained before we give you the key.

If you would like the profits of a Weatherly plant, with all its advantages, let us talk to you about it. No charge or obligations, of course.

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The D. M. WEATHERLY COMPANY

Industrial Engineers and Builders

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COMMENTING FREELY

by

Bruce Moran

They are carefully disinfecting planetary missiles, so as not to disturb the bacteriological status of the moon and the planets we may hit soon. They are measuring with a wavelength of light, because the famous meter bar, standard for seventy years, has become not quite accurate enough. They are checking radiation 100,000 miles out into space.

Things are getting pretty precise in science. But where is the precision the farmer needs in his soil tests and his plant food grades? Where is the knowledge we need of the real reactions of the soil to varying applications of N, P and K? Where is the quick, scientific analysis we need of these reactions, as we become impatient during the long drawn out testing-by-growing process?

Is it lack of money for real basic agricultural research? Or are we, as an industry, asleep at the switch? Isn't it possible that some competitors, in and out of the industry, are on the verge of finding new ways that will sell new volume at a new profit? When even atomic energy is at work making changes in crops, as it is, we had better look to our bread and butter better.

COMMERCIAL FERTILIZER and PLANT FOOD INDUSTRY

Vol. 101, No. 6 December, 1960

Established 1910

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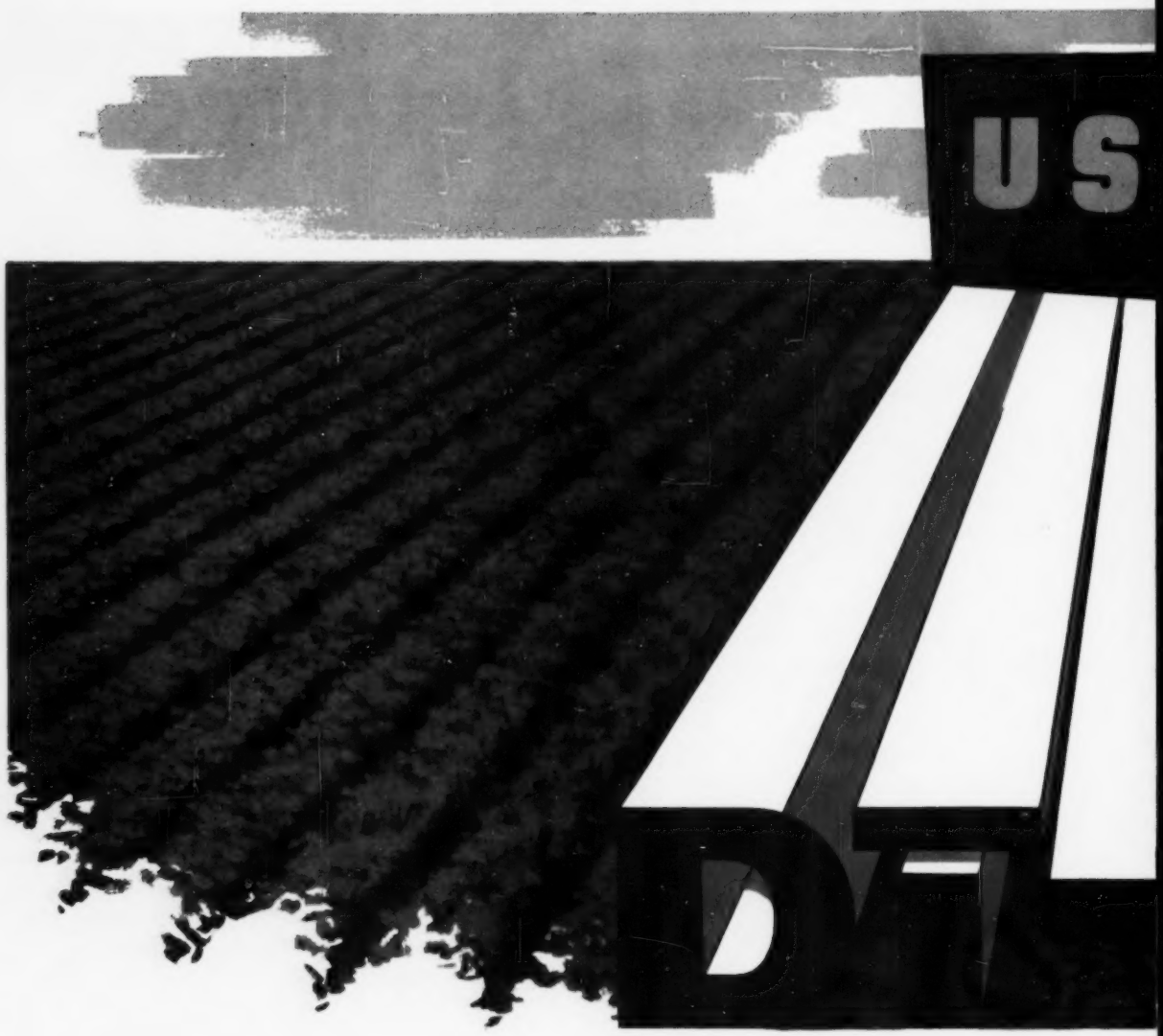

18-46-0

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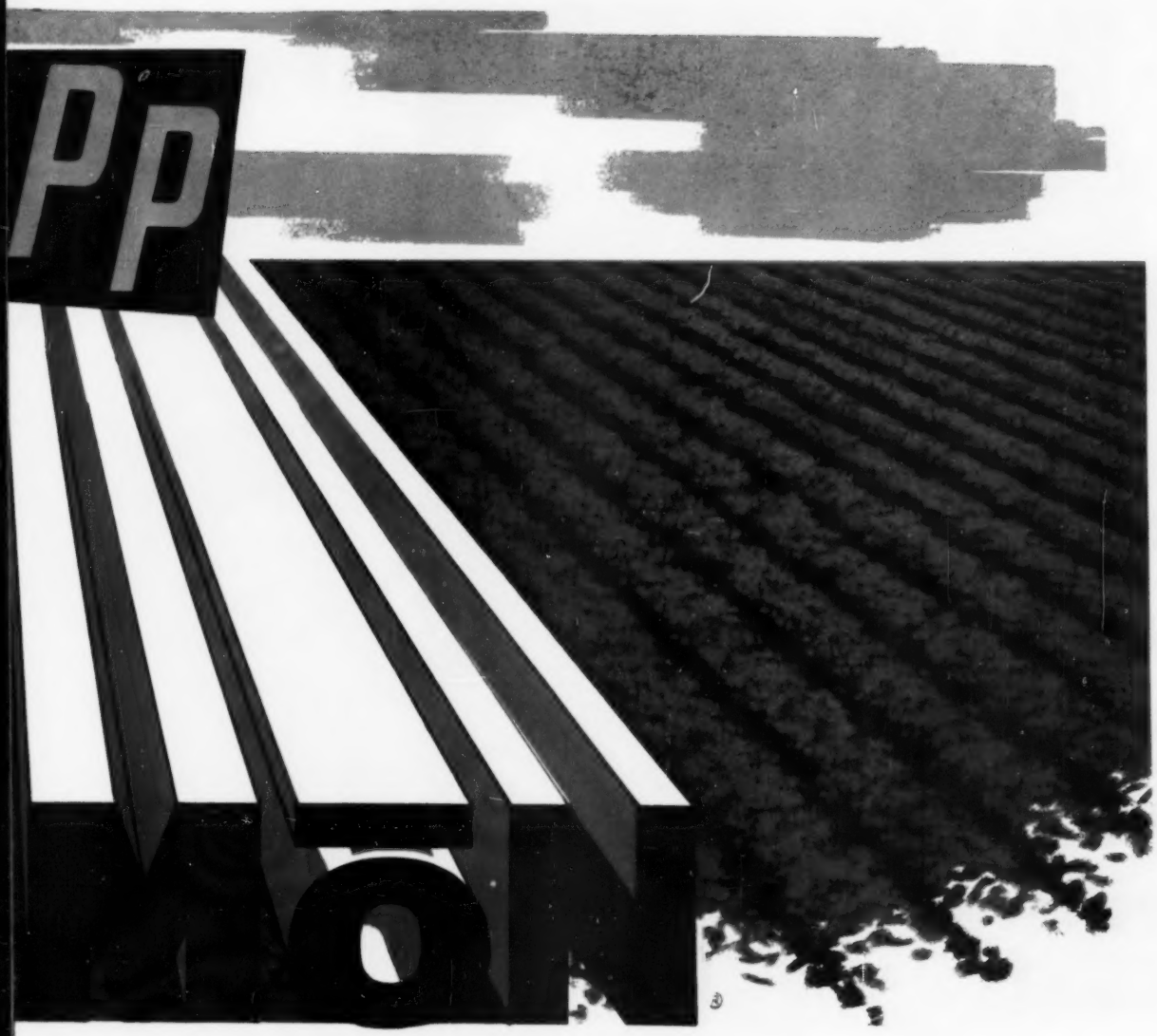

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Division

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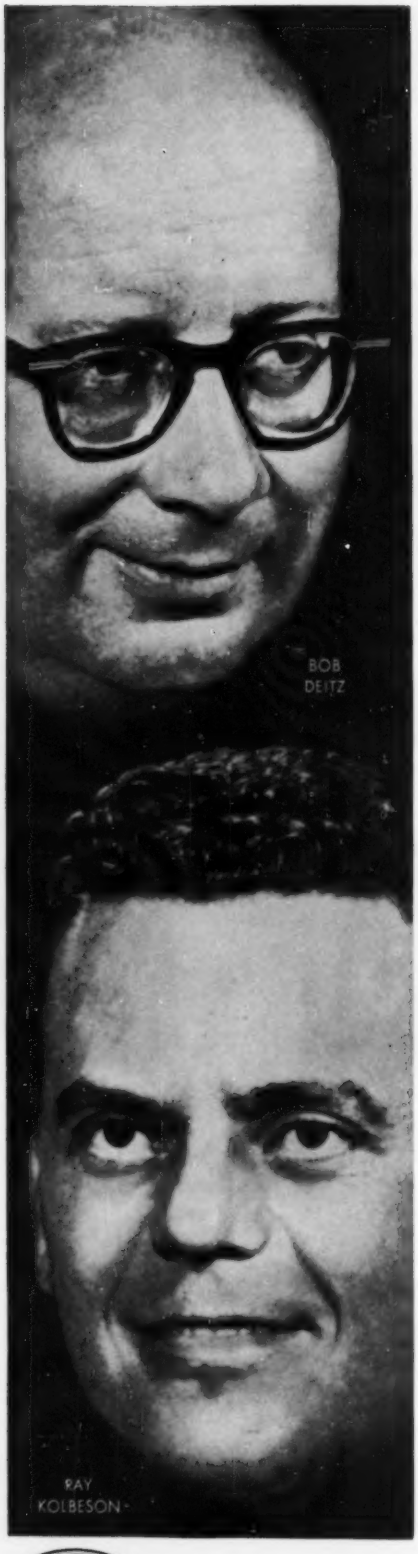

Many U.S.I. customers in the fertilizer industry know Bob Deitz and Ray Kolbeson. As chief and assistant chief chemists at our Tuscola, Ill., Plant Laboratory, their imprint is on each tank truck and car of U.S.I. fertilizer chemicals — ammonia, nitrogen solutions, sufuric acid and phosphoric acid — shipped from Tuscola. They head a team responsible for the quality of all fertilizer chemicals made at Tuscola.

Yet these chemists do much more than simply provide the customer with an analysis of each shipment. They inspect plant production continually to help maintain the consistent quality customers require. And the analytical knowledge possessed by Bob, Ray and their colleagues is at the disposal of U.S.I. customers for all sorts of problems.

For example, they will perform special analyses for trace materials or uncommon constituents . . . will provide both standard and special test procedures. They have helped newcomers to the fertilizer business set up labs by providing advice on equipment, procedures, personnel. And they have carried out check analyses with customer labs.

Both men bring wide experience in the field to their jobs. Bob has been an industrial chemist for 20 years—three of them as a referee analyst in inorganic chemistry. He is now a member of the National Plant Food Institute's Task Force for Liquid Fertilizers. Ray numbers 12 years as a research and industrial chemist.

These men work for you as well as for us. A call to U.S.I. Heavy Chemical Sales in New York — OXford 7-0700 — can put them at your service.

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Division of National Distillers and Chemical Corp.
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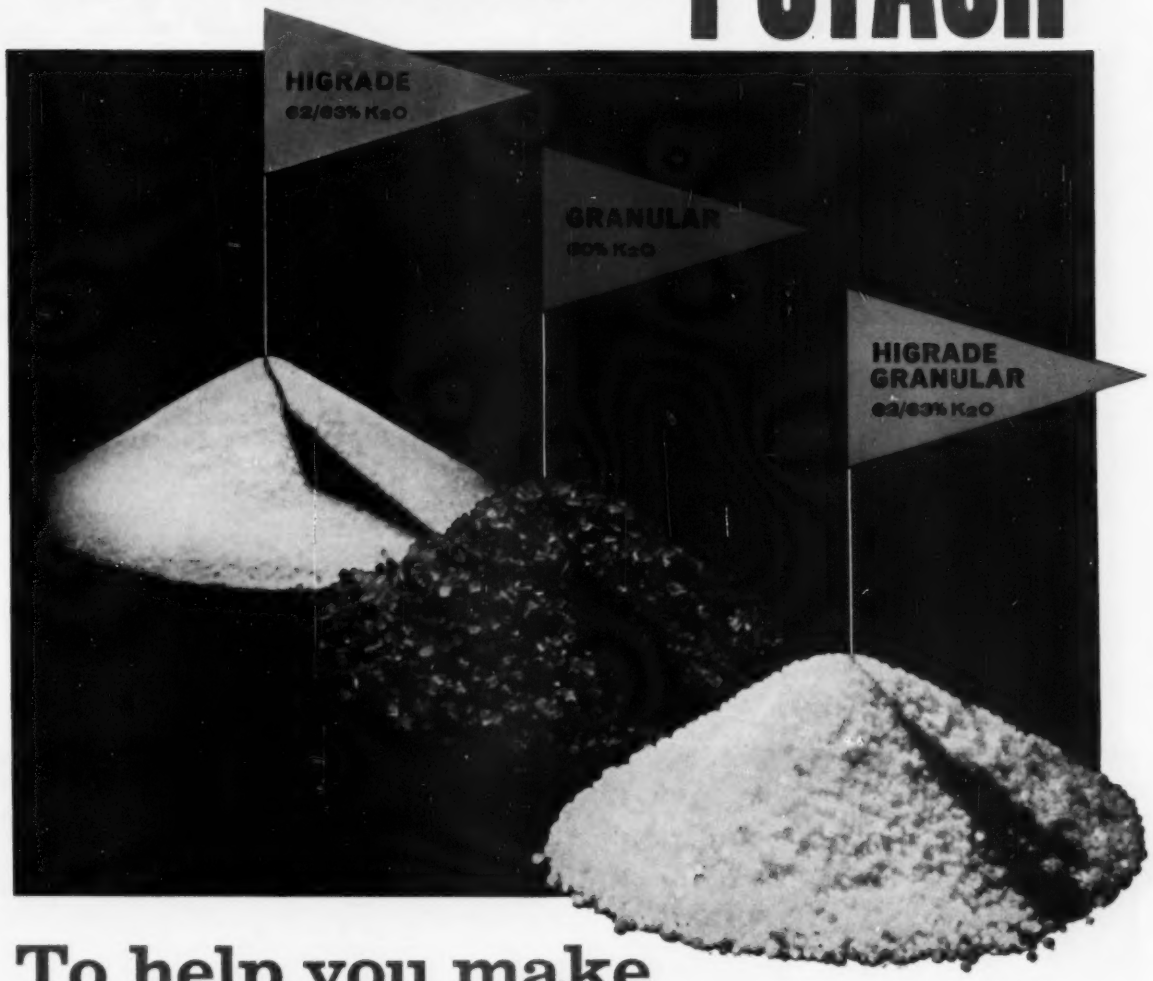

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Order Fertilizer Borate-65 now!

Here is potash you can depend upon—for highest quality—for maximum freedom from caking in storage and handling. Take your choice of three types; all readily available for immediate shipment. You'll find each to be ideally sized to meet your current manufacturing requirements.

For more than a quarter of a century, our potash products have kept pace with all the exacting specifications of the fertilizer industry. That's why you can confidently count on getting exactly the kind of potash you want... when you want it... from U. S. Borax & Chemical Corp.

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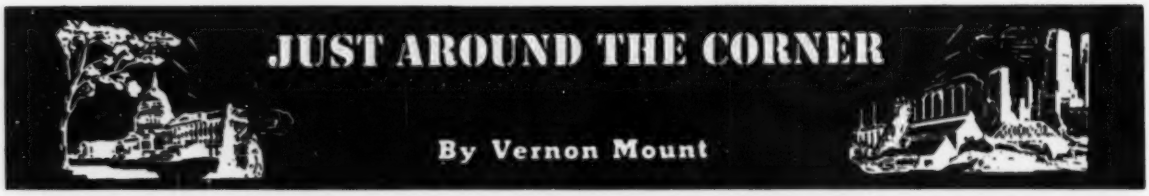


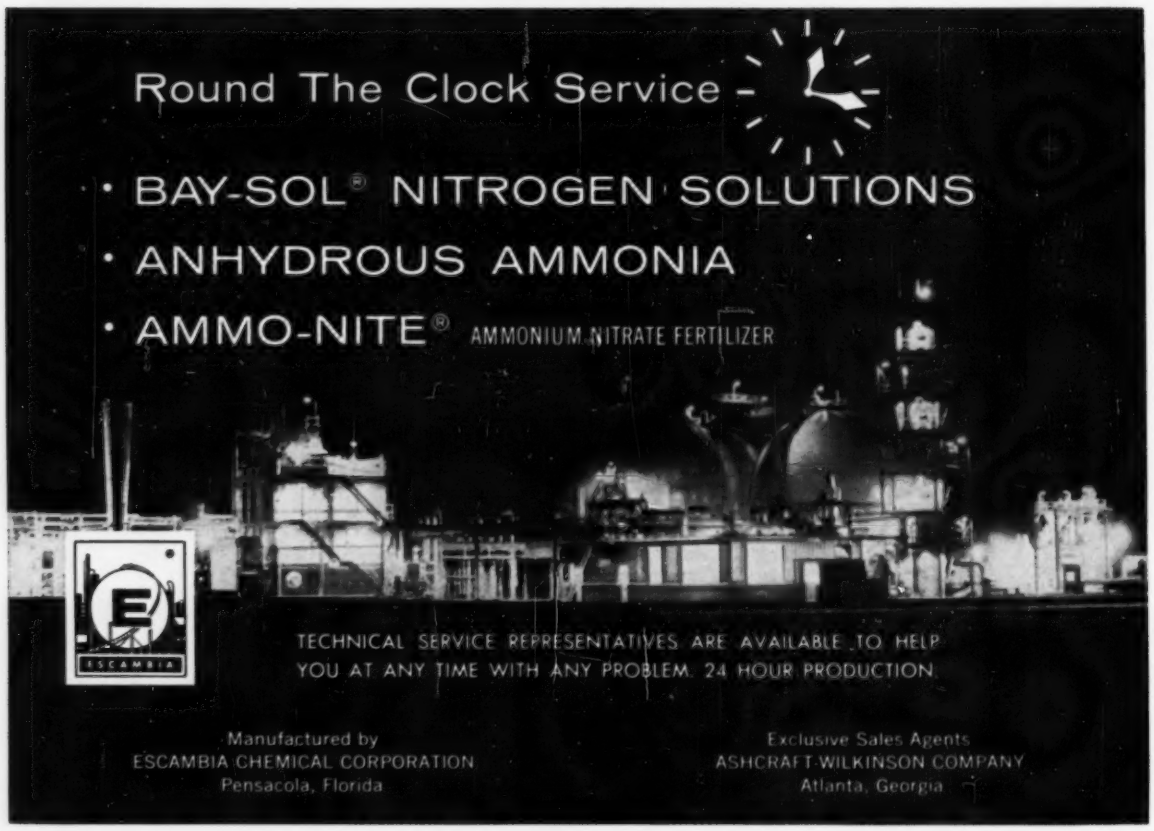
A 50/50 VOTE is no mandate, and our new president is well aware of that fact. On the other hand, both candidates were considerably to the left of President Ike; both expressed themselves firmly in favor of putting the pitchfork back of the economy and stirring up more growth and development of our industry and wages for our workers.

NOT QUITE CONSERVATIVE, therefore, is the outlook. The gold situation was frightening to both, and will guide policy. The amazing vote of the farmers for Nixon should modify the farm program announced by Kennedy (and so heartily decried by USDA). But there is still much that can be done, with sanity, for agriculture - including leaving it to work out its own salvation.

BIPARTISAN appointments have already become evident as I write this letter, and more can be expected. Jack Kennedy is smart; he believes in surrounding himself with competent men...and if the best turn out to be Republicans, he is quite capable of choosing them.

Yours faithfully,

Vernon Mount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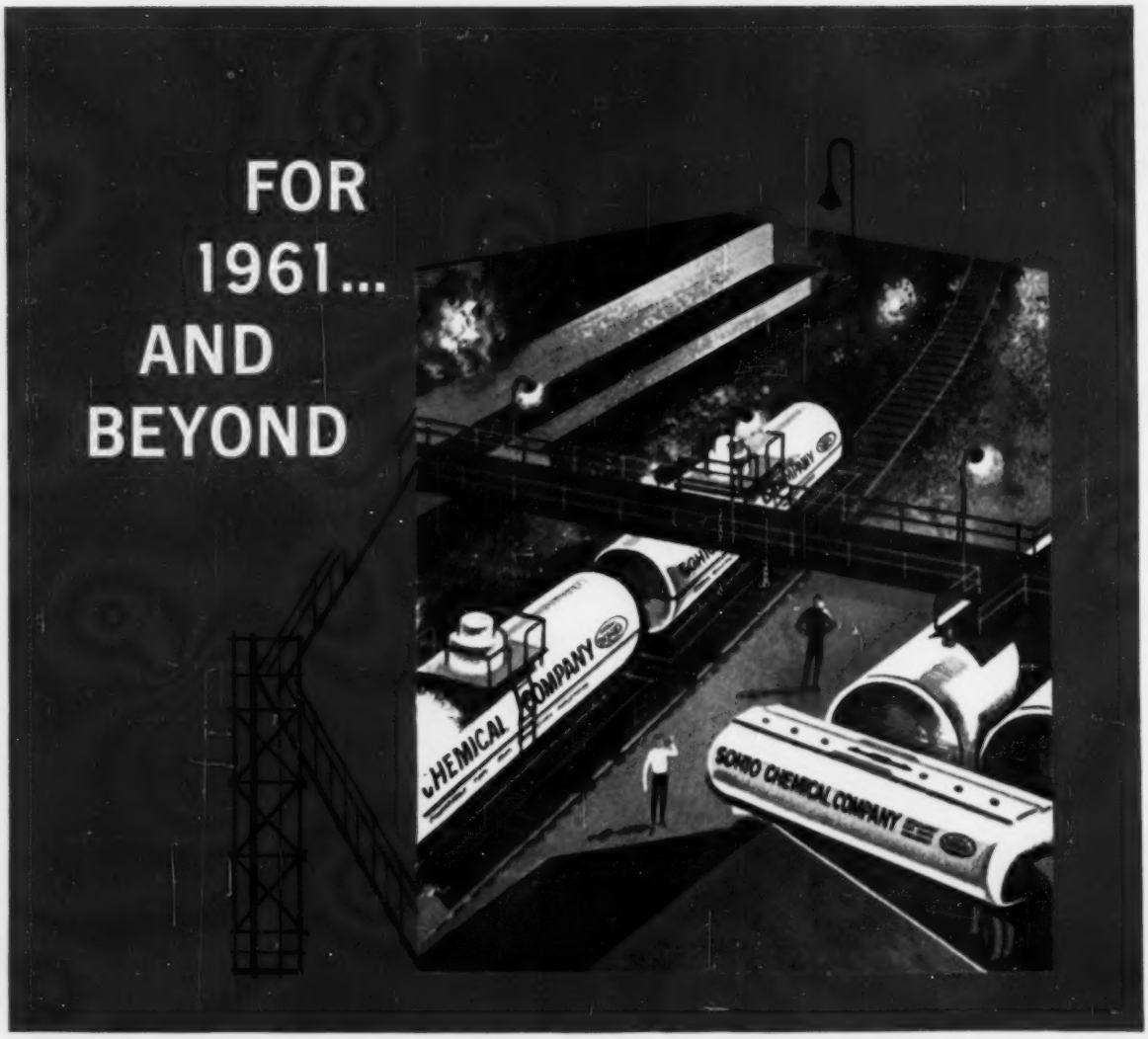

Fertilizer industry goals rate priority planning at SOHIO

Sohio's success depends upon a healthy, vigorous fertilizer industry. That's one of the reasons why Sohio lends full support to these goals that will benefit you and your company:

- Improvements in fertilizer technology and new developments in manufacturing.
- Advances in chemical control methods.
- Educational and public relations programs that benefit both the fertilizer industry and agriculture.
- Encouraging research in soil science, agronomy, fertilizer economics and related fields.

These goals have always rated priority planning at Sohio. They are the key to our thinking in providing products and services for you.

Call the "Man from Sohio" for details on Sohio SERVICE and a complete line of nitrogen materials: high-quality anhydrous ammonia . . . aqua ammonia . . . 45% coated or 46% uncoated urea . . . 18 nitrogen solutions, including all urea types.

SOHIO

. . . we're serious about SERVICE at Sohio

SOHIO CHEMICAL COMPANY

Agent for Solar Nitrogen Chemicals, Inc.

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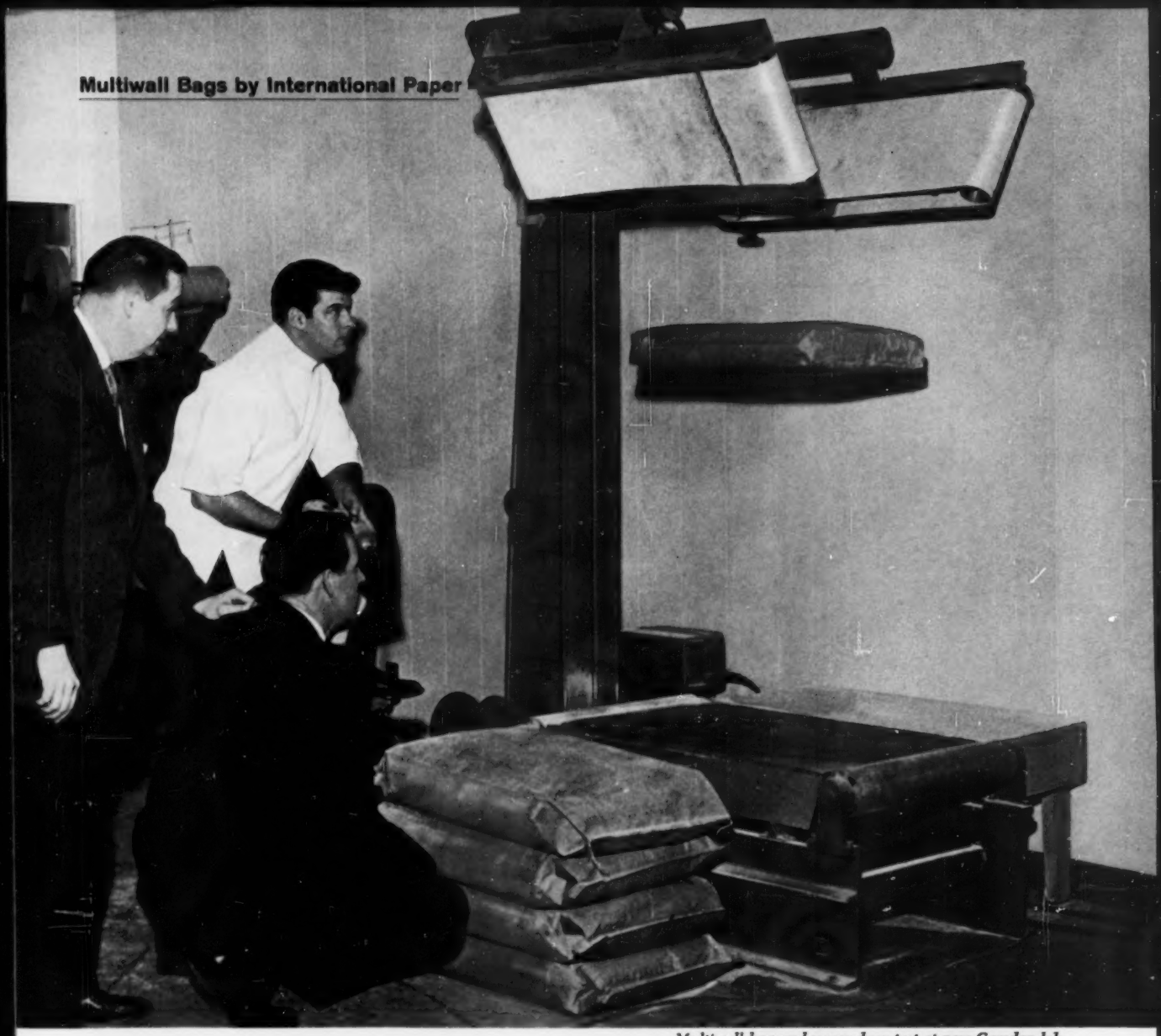
Phone CApitol 5-8015 or wire ITWX call letters LIMA O 497-U

Multiwall Bags by International Paper



Multiwall bag undergoes drop test at new Camden lab.

Trial by torture

Read about International Paper's new Camden lab —a modern proving ground for multiwall bags.

MULTIWALL BAGS must withstand punishment. It is their job. But, as industry expands its use of multiwalls, each new product presents totally new problems for these versatile bags.

This is why International Paper built the most modern research and development center at their Camden, Arkansas Bagpak® plant.

Here, new bag papers, adhesives and closing materials are subjected to virtually every gruelling condition they might meet en route from plant to consumer. The bag in our photograph is undergoing a drop test, one of many tortures new bags encounter.

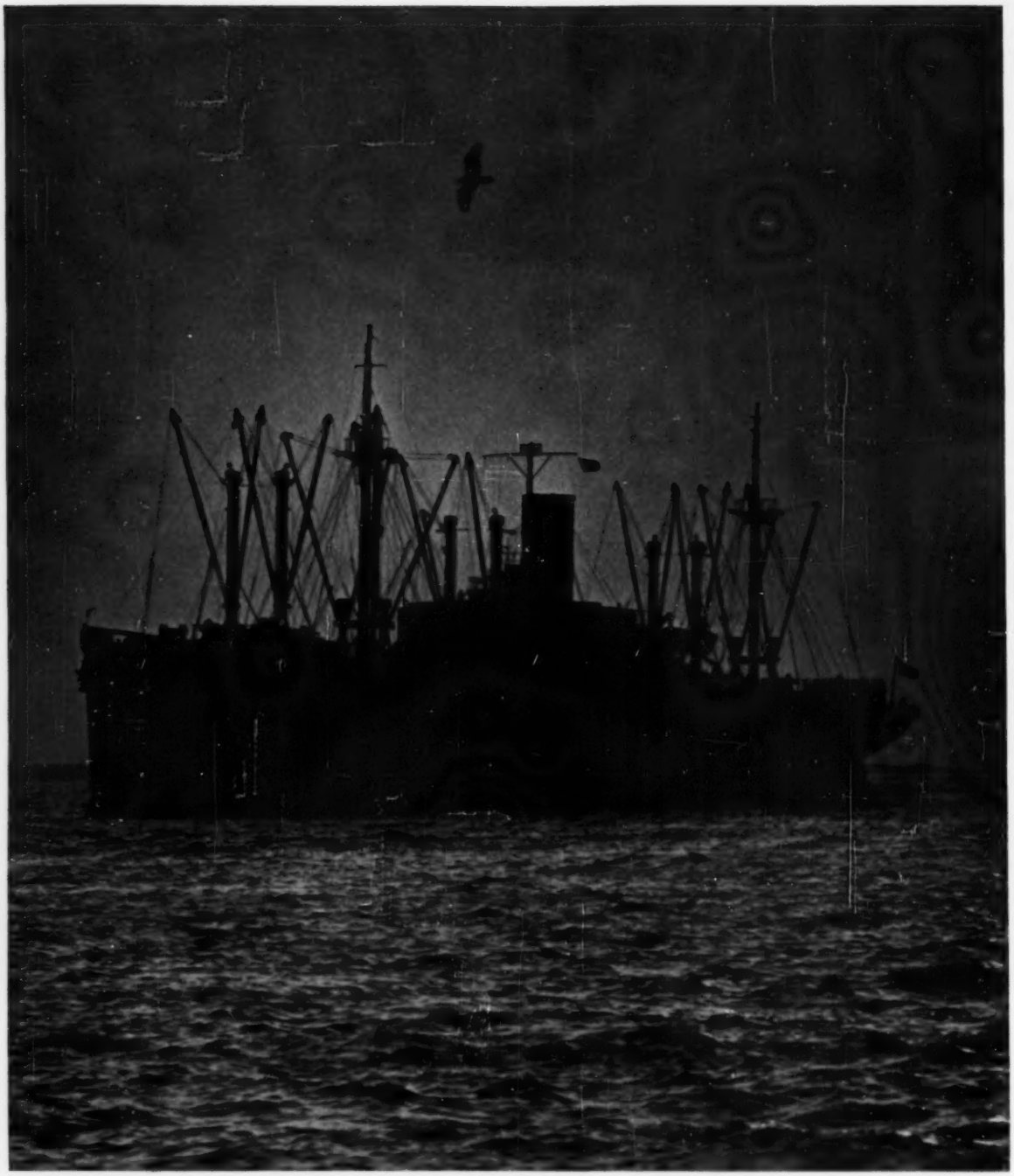
Our laboratory also includes an "Arctic-Jungle Room" where temperature and humidity may be varied *drastically*. A vibration table to simulate the effects of truck and rail motion. And the latest equipment to determine exactly the right bag for any product—new or old.

These are just a few of the tests our bags meet. Each one is designed to help us make better multiwall bags. Bags that withstand long-distance hauling, extreme weather, rough handling and high-speed filling.

Whatever your multiwall packaging needs, you will find it profitable to talk to your Bagpak packaging engineer. He has complete information.

INTERNATIONAL PAPER

BAGPAK DIVISION • NEW YORK 17, N. Y.



IS there a urea so good it's worth going 3000 miles for?

There is. It comes from Cobelaz of Belgium—*and no one else.* It is probably the most unusual urea prill available in America today. People who have used it consider it the best.

It's the urea that goes contrary to all the old notions about prills—*it's uncoated!* Very much to your advantage. These prills are so skillfully made you get less moisture than with coated material. They are guaranteed to be free-flowing. You get better storage. You get no dust. And—you get a guaranteed 46% nitrogen at the same price as 45% material!

As the first step to seeing how much better these urea prills can do the job for you, we would like to send you a sample and additional information. We are sole agents in the U.S. for Cobelaz of Belgium. Storage stocks are located near all major consuming areas. Write today for sample and delivered price.

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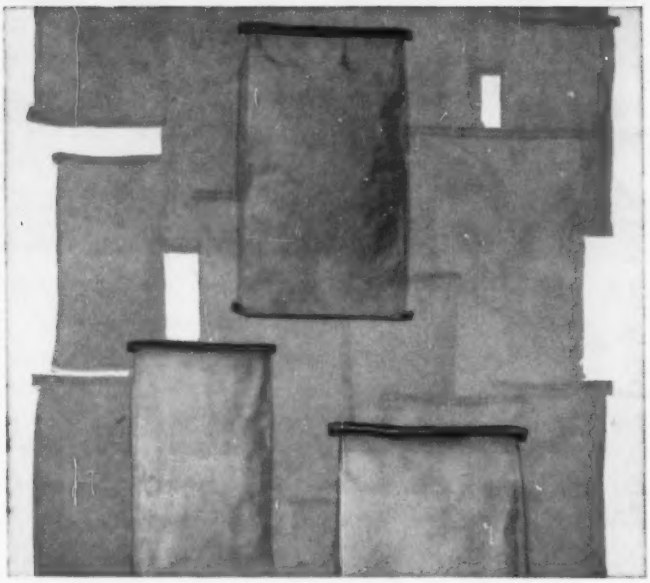
Established 1850

in one year over 165 multiwall users reduced total packaging costs through UNION-CAMP's

SPECIFICATIONS CONTROL



another FREE service of the 5 Star Packaging Efficiency Plan!

Could more efficient specifications control help you get more for your multiwall dollar? It has for more than 165 other firms who took advantage of the 5-Star Packaging Efficiency Plan. In one year alone!

UNION-CAMP multiwall specialists reduced total packaging costs for these companies by applying proved principles of specifications control. For example, standardizing bag styles—eliminating special or odd bag sizes. The improvements simplified filling and closing—reduced inventory levels. They also freed valuable warehouse space—saved tens of thousands of dollars a year.

There's probably a phase of your operation where substantial economies could be effected by the 5-Star Plan. Apart from specifications control, this packaging service offers you profit-producing improvements in bag design, bag construction, packaging machinery—plus a detailed survey of your plant.

And it doesn't cost a penny!

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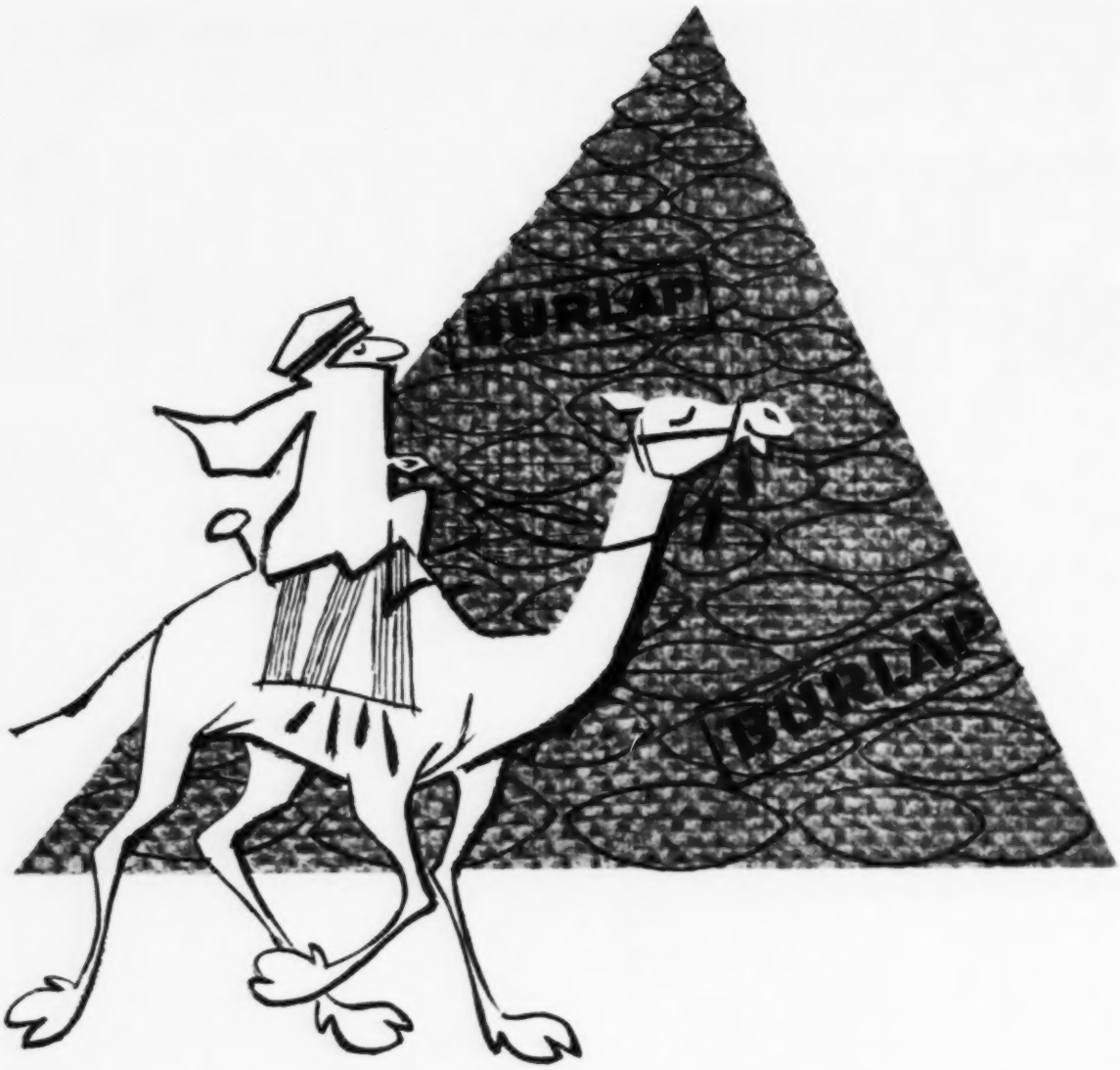
MULTIWALL BAGS
Union Bag-Camp Paper Corporation 233 Broadway N.Y. 7, N.Y.

★ BAG DESIGN · BAG CONSTRUCTION · SPECIFICATIONS CONTROL · PACKAGING MACHINERY · PLANT SURVEY



Only Burlap stacks up to every need!

Want *important* savings? Use burlap. You save on space, because burlap bags stack higher. You save on waste...burlap keeps breakage down. You save on handling costs...only burlap can take on 200 pound loads. You save on the bags themselves...burlap is re-usable. And another big plus...the farmer likes burlap. *He* asks for it. You should too.

THE BURLAP COUNCIL · 122 East 42nd Street, New York 17

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SWIFT'S MINUTE MAN PHOSPHATES

Phosphate Rock—Ground and Unground Triple Superphosphate

Extra care at Swift's Phosphate Center means extra care in every stage of filling your needs . . . extra care in prospecting and mining . . . extra care in processing and quality control . . . extra care in scheduling and shipping . . . even extra care in record keeping.

It is the kind of extra care you get only from people who know they serve themselves best by serving you best, just as the Minute Man, who symbolizes Swift's phosphatic products, served himself by serving others.

You'll enjoy doing business with Swift's Phosphate Center . . . with dedicated people who want to serve you with extra care. Have a Swift Phosphate Center Representative outline the advantages Swift's service offers you in phosphates—triple, phosphate rock or ground phosphate rock.

THE SERVICE CENTER FOR ALL YOUR PHOSPHATE NEEDS

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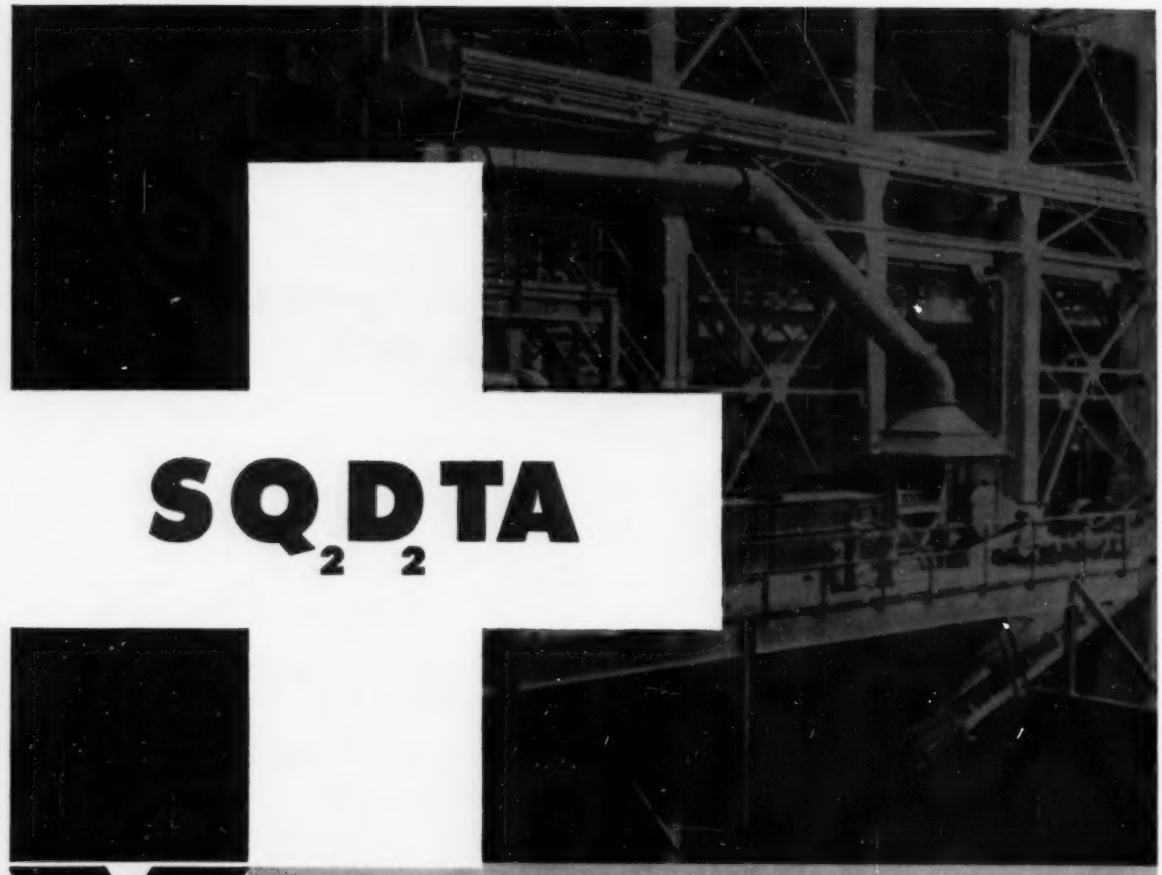
To Serve Your Industry Better WITH MINUTE MAN PHOSPHATE ROCK, GROUND PHOSPHATE ROCK AND TRIPLE SUPERPHOSPHATE

P-4



SQ_2D_2TA

The DAVISON formula that multiplies your profit potential

There's a formula for practically everything in the fertilizer industry. There is even one for PROFIT—the exclusive Davison formula SQ_2D_2TA.

It is symbolic of the *extra effort* put into every Davison product. With every carload of phosphate you get a generous shipment of properly proportioned amounts of Service, Quality, Dependability, Delivery and Technical Assistance . . . all working together to help you realize a higher profit on your operation.

It goes almost without saying that Davison is satisfied only with the utmost accuracy in its phosphate formulas, with precision care in processing. The end result is a Davison product you can be sure is unexcelled in its field.

Try a test carload with the Davison *Plus Factors*. Call us today about your needs—SAratoga 7-3900, Baltimore.

Hi-Flo Gran-U-Lated Triple Superphosphate • Hi-Flo Run-O-Pile Triple Superphosphate • Hi-Flo Blend-Phos Triple Superphosphate • Granulated Single Superphosphate • NEW Run-of-Pile Single 20% Superphosphate • Phosphate Rock—All grades • Phosphoric Acid • Sulfuric Acid • Oleum • Granulated Diammonium phosphate 16-48-0

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BALTIMORE 3, MARYLAND

Arcadian® News

Volume 5 | For Manufacturers of Mixed Fertilizers | Number 12

Where Are Your Best Fertilizer Markets?

NEW 1959 CENSUS FIGURES NOW BEING RELEASED SHOW WHICH COUNTIES AND CROPS USE THE MOST FERTILIZER

New information about the importance of each county in the United States as a fertilizer market is now being made available with the release of preliminary reports from the 1959 Census of Agriculture. These reports contain a wealth of data of vital interest to everyone who sells dry or liquid mixed fertilizers and fertilizer materials.

As we go to press, information has been published on counties in 34 states. Data on counties in additional states are now being compiled and will be released soon.

These preliminary reports reveal many findings on the use of commercial fertilizer:

- **Total farms in each county.**
- **Farms using fertilizer.**
- **Total acres fertilized.**
- **Total tons of fertilizer.**
- **Tons of dry materials used.**
- **Tons of liquid materials used.**

For each major crop classification for each county, the reports show the total acres fertilized and the amounts of dry and liquid materials used. Thus you have a graphic picture of the fertilizer market by counties and by crops. *(All figures on the use of fertilizer are based on information obtained from every fifth farm projected to cover all farms in the county.)*

To demonstrate to you the type of information that is contained in these preliminary reports, the Arcadian News has prepared statewide tables for Illinois, Indiana and Ohio which appear on the two following pages. Similar data are available for each county in the three states, but space does not permit tables for all counties. We have also prepared a county map of the three states showing degree of intensity of commercial fertilizer consumption by counties.

It is interesting to note that corn is by far the largest user of commercial fertilizer in these three states, consuming 60% more than all other crops combined. Wheat is in second place with soybeans third.

From 1954 to 1959, there was a 19.6% reduction in total number of farms in the three states and a 12.7% reduction in number of farms using commercial fertilizer; but the number of acres fertilized increased 3.7%.

Are You Interested?

After you have examined the map and the data on the following two pages, please let us know whether you would be interested in having a similar county map of the entire United States and fertilizer data on each county similar to the statewide data on Illinois, Indiana and Ohio.

IF enough of our readers desire such data, Arcadian News will tackle the monumental task of tabulating and reproducing all of this information and placing it in your hands, without charge or obligation. Of course this cannot be done until preliminary census reports for all states have been released. Please let us know your wishes. Simply write to: ARCADIAN NEWS, Nitrogen Division, Allied Chemical Corporation, 40 Rector Street, New York 6, N. Y.

1959 Fertilizer Consumption

Based on U.S. Census of Agriculture Preliminary Figures Just Released

ILLINOIS

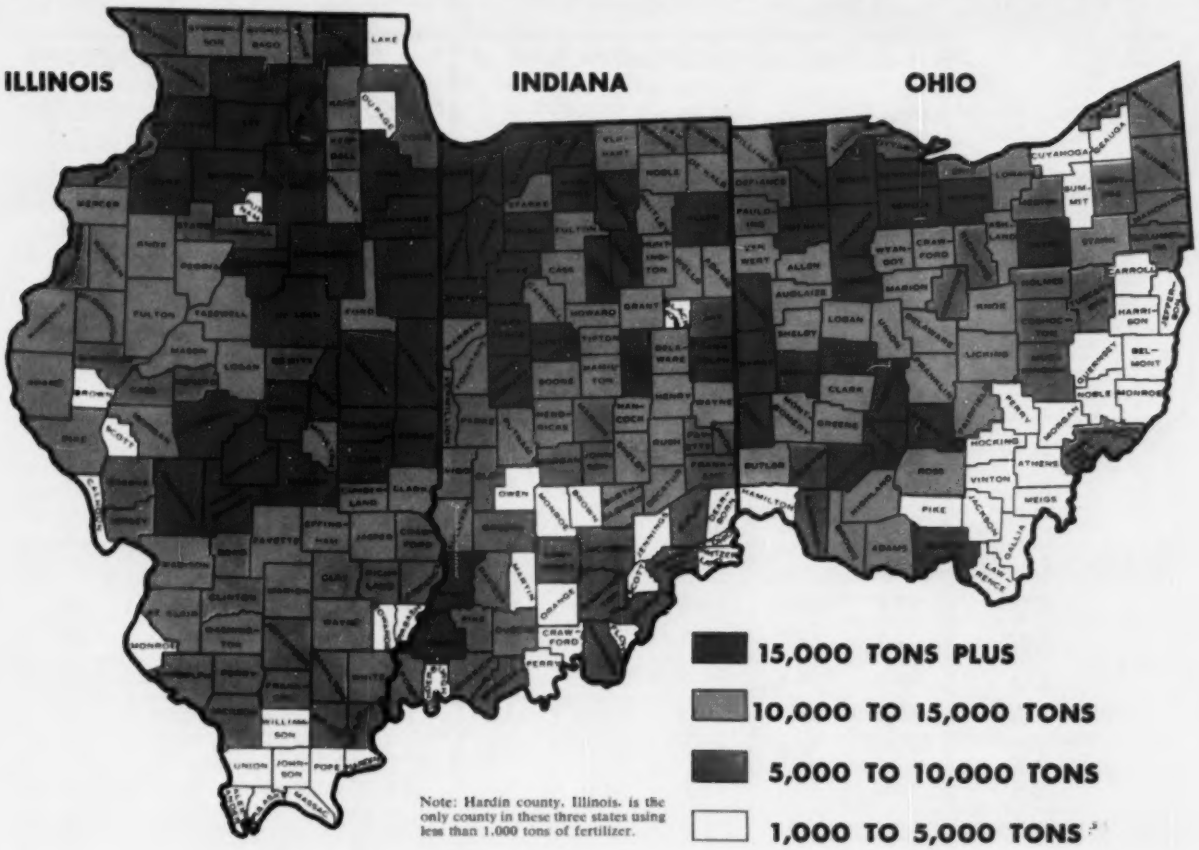
TOTAL FARMS IN STATE 154,640
FARMS USING FERTILIZER 107,632
TOTAL TONS OF FERTILIZER . . . 1,219,329

CROP	Acres Fertilized	Tons Dry Material	Tons Liquid Material
CORN	6,483,003	677,542	143,481
WHEAT	1,255,233	147,045	15,171
SOYBEANS	489,998	55,984	1,754
HAY & CROPLAND PASTURE	318,789	76,013	2,156
All Other Crops Including Non-Cropland Pasture	532,075	97,262	2,921
TOTAL ALL CROPS	9,079,098	1,053,846	165,483

INDIANA

TOTAL FARMS IN STATE 128,160
FARMS USING FERTILIZER 102,416
TOTAL TONS OF FERTILIZER . . . 1,005,600

CROP	Acres Fertilized	Tons Dry Material	Tons Liquid Material
CORN	4,839,631	581,559	58,415
WHEAT	1,163,838	140,987	6,182
SOYBEANS	823,685	63,284	1,437
HAY & CROPLAND PASTURE	302,942	40,451	1,284
All Other Crops Including Non-Cropland Pasture	890,769	108,103	3,898
TOTAL ALL CROPS	8,020,865	934,384	71,216


ILLINOIS
INDIANA
OHIO
15,000 TONS PLUS
10,000 TO 15,000 TONS
5,000 TO 10,000 TONS
1,000 TO 5,000 TONS
Note: Hardin county, Illinois, is the only county in these three states using less than 1,000 tons of fertilizer.

OHIO

TOTAL FARMS IN STATE 140,353
FARMS USING FERTILIZER 111,441
TOTAL TONS OF FERTILIZER 933,759

CROP	Acres Fertilized	Tons Dry Material	Tons Liquid Material
CORN	3,423,979	489,658	22,800
WHEAT	1,273,750	176,246	4,880
SOYBEANS	296,657	26,342	586
HAY & CROPLAND PASTURE	279,306	42,375	521
All Other Crops Including Non-Cropland Pasture	1,118,438	166,862	3,489
TOTAL ALL CROPS	6,392,130	901,483	32,276

Arcadian® NITROGEN SOLUTIONS

	CHEMICAL COMPOSITION %						PHYSICAL PROPERTIES		
	Total Nitrogen	Anhydrous Ammonia	Ammonium Nitrate	Urea	Water	Neutralizing Ammonia Per Unit of Total N (lbs.)	Approx. Sp. Grav. at 60°F	Approx. Vap. Press. at 104°F per Sq. In. Gauge	Approx. Temp. at Which Salt Begins to Crystallize °F
NITRANA®									
2	41.0	22.2	65.0	—	12.8	10.8	1.137	10	21
2M	44.0	23.8	69.8	—	6.4	10.8	1.147	18	15
3	41.0	26.3	55.5	—	18.2	12.8	1.079	17	-25
3M	44.0	28.0	60.0	—	12.0	12.7	1.083	25	-36
3MC	47.0	29.7	64.5	—	5.8	12.6	1.089	34	-30
4	37.0	16.6	66.8	—	16.6	8.9	1.184	1	56
4M	41.0	19.0	72.5	—	8.5	9.2	1.194	7	61
6	49.0	34.0	60.0	—	6.0	13.9	1.050	48	-52
7	45.0	25.3	69.2	—	5.5	11.2	1.134	22	1
URANA®									
6C	43.0	20.0	68.0	6.0	6.0	9.3	1.180	12	39
6M	44.0	22.0	66.0	6.0	6.0	10.0	1.158	17	14
10	44.4	24.5	56.0	10.0	9.5	11.0	1.114	22	-15
11	41.0	19.0	58.0	11.0	12.0	9.2	1.162	10	7
12	44.4	26.0	50.0	12.0	12.0	11.7	1.087	25	- 7
13	49.0	33.0	45.1	13.0	8.9	13.5	1.033	51	-17
DURANA*									
DURANA is a trade-mark of Allied Chemical Corporation.	37.0	13.3	53.4	15.9	9.4	7.2	1.235	0	36
U-A-S®									
A	45.4	36.8	—	32.5	30.7	16.2	0.932	57	16
B	45.3	30.6	—	43.1	26.3	13.5	0.978	48	46
Anhydrous Ammonia	82.2	99.9	—	—	—	24.3	0.618	211	-108

*DURANA contains 8% formaldehyde.

Other ARCADIAN® Products: URAN® and FERAN® Solutions • Ammonia Liquor • N-dure® A-N-L® • Ammonium Nitrate • UREA 45 • Nitrate of Soda • Sulphate of Ammonia

When you purchase your nitrogen requirements from Nitrogen Division, Allied Chemical, you have many different nitrogen solutions from which to select those best suited to your ammoniation methods and equipment. You are served by America's leading producer of the most complete line of nitrogen products on the market. You get formulation assistance and technical help on manufacturing problems from the Nitrogen Division technical service staff. You benefit from millions of tons of nitrogen experience and the enterprising research that originated and developed nitrogen solutions.

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Round Table Conference Sets Another Record

The industry's big technical conference, the Fertilizer Industry Round Table, continued its annual performance to a sell out crowd of more than 425 at Washington, D. C. last month. The program centered around phosphates, standardization of raw materials, instrumentation and preneutralization.

In the absence of Vincent Sauchelli—away on a phosphate assignment with the government of India—who has chairmanned the executive committee in past years, Davison Chemical's **Joe Reynolds** did an expert job of heading up the executive body. Serving with him, and sharing the task of moderating the sessions, were the other two committee members who have contributed so much to the success of this meeting, **Al Spillman** of Fertilizer Manufacturing Cooperative and **H. L. Marshall** of Olin Mathieson Chemical Corp.

Phosphates

The initial day of the meeting was given over to phosphates, with Moderators Reynolds and Spillman keeping things running smoothly. **Jim Engibous** of International Minerals & Chemical Corp. led off with a summary of the present and future status of phosphate rock. He outlined the prospecting and mining methods, described how various phosphate products are extracted for shipment to the fertilizer industry, and reviewed the specifications and quality control measures exercised on the goods, including the inter-laboratory check sample program.

Superphosphate

Henry Wheless of Davison Chemical Division, W. R. Grace & Co., told about their conversion to continuous superphosphate production. Under the old batch method where two mixers made 175 charges to fill each of three dens, he said there was considerable variation in product quality within each den. Since installation of the Sackett 'Superflo' continuous operation last year, product quality has been consistent at a production rate of nearly 100 tons an hour on a unit designed for 90 tons hourly. As illustrated in a flow diagram with slide projections, rock feed to the TVA-type mixing cone comes from a surge bin through a screw conveyor onto a weigh-feeder; the load on the weigh feeder controls the screw conveyor speed to maintain a constant flow. After mixing with acid in the cone, the material is discharged into a single shaft pugmill, retained for 1½ minutes, and fed onto a 70-foot steel slat conveyor which is used as a solidifier. After a 30-minute retention time here, the superphosphate is excavated by helical cutter bars with six rows of 11 stainless steel teeth. The entire system is covered with rubber-lined hoods and ducts for removal of fumes to a fluorine recovery unit.

Shooting for a 98.5% conversion, Mr. Wheless said that 18 months operation at Davison's Curtis Bay, Md. plant have showed the goals were achieved. Answering a question from the floor, he said that the same unit lends itself well to producing a 28-30% P_2O_5 fortified superphosphate by feeding combined sulfuric and phosphoric acids into the mixer; also, he added, the same equipment can be utilized for triple superphosphate production by using a by-pass on the bottom of the pugmill. Responding to another question, Mr. Wheless said there was no significant difference in the density of the superphosphate as compared with the product from their previous method.

Top: The Round Table Executive Committee—Chairman Joe Reynolds of Davison Chemical Division, W. R. Grace & Co.; Al Spillman of Fertilizer Manufacturing Cooperative; and H. L. Marshall of Olin Mathieson Chemical Corp. All are located in Baltimore.

Center: Clem Giles of California Chemical's Ortho Division, Richmond, Calif., shows some complex fertilizer samples to Frank Freiler and Jack McLellan of Vitro Engineering, New York.

Bottom: Ed Kingsbury of Kingsbury & Co., Indianapolis, Al Spillman of Fertilizer Manufacturing Cooperative, Baltimore, and E gene A. Reichard of Robert A. Reichard, Inc., Allentown, Pa., compare notes. Mr. Kingsbury and Mr. Reichard were participants in the Raw Materials Users Panel which Mr. Spillman moderated.

Phosphoric Acid

William Weber of Dorr-Oliver Inc. spoke about the types, sources and characteristics of phosphoric acid. He placed capacity to produce this acid at 2.6 million tons annually, with more production units under construction. He said wet-process acid quality can be improved as better materials go into the plants. Plants are currently being built to produce 'superphosphoric' acid from both furnace-grade and wet process acids, Mr. Weber stated.

A question from the audience prompted a comment by Al Phillips of Tennessee Valley Authority that superphosphoric from wet process acid is more viscous than that from furnace acid, and that it requires a positive-displacement pump rather than a centrifugal pump.

Melvin Leach of Indiana Farm Bureau Cooperative Assn. and **Rodger Smith** of Eastern States Farmers Exchange spoke jointly on the use of phosphoric acid in mixed fertilizer production.

Mr. Leach traced their experience since 1955, when use of furnace acid began at their plants. He outlined their experience with storage, and said that a rubber lining—spark-tested after installation—had proved satisfactory on 10' x 18' tanks, while other spray-type linings survived for only a year. Volumetric meters were initially used, but IFB has now switched to magnetic flowmeters, he said. Acid temperature is important, he emphasized. Sparging the acid under the bed of materials in

the ammoniator is preferable, Mr. Leach felt, but their plants spray it in from above the bed to extend the life of spray pipes.

On a 5-20-20 grade, savings in use of phosphoric instead of sulfuric acid ranged from eight cents to $1.42 at their four plants, depending on location; however, he cautioned that savings run less if sulfuric acid is needed for heat. Equipment must be considered in this decision, Mr. Leach stated, especially dryer capacity. Reviewing their experience with wet process acid, he said that the car-to-car variation is a factor and that precipitated solids remaining in the car can create an inventory problem.

Rodger Smith said that use of phosphoric acid in mixed goods is now well established, and that production has increased 60% in two years; he proved his point by asking for a show of hands from audience members who use the material in their operations. He cited the following as advantages from use of the acid in granulation: increased plant nutrient concentration, lower cost formulations, better granulation, and less formation of noxious nitrogen-compound fumes. This method of reducing nitrous oxide stack plume is preferable to installation of a scrubbing system, he said. While heat of reaction is one-third less with phosphoric acid as compared with sulfuric, he reminded that process water temperature can be adjusted to compensate this. Granule stability is good and recycle rate is low, he asserted, assuming adequate drying.

Magnetic flowmeter performance is excellent, Dr. Smith stated, if a simple provision for calibration is made by installation of an ex-meter volumetric measurement tank and charts are used. Answering a question, he said their experience showed that up to 300 pounds of acid per ton of goods could be used without excessive recycle. In response to another question he recommended stainless steel pumps, stainless steel and polyvinyl chloride piping, and Hastelloy-C spargers.

Commenting on the panel, Moderator Reynolds pointed out that there is slightly less nitrogen rentention in 1:4:4 ratios when the phosphoric acid is sprayed on the bed of materials rather than sparged under the materials.

F. M. Batson of Allied Chemical's General Chemical Division, speaking on storage and handling of phosphoric acid, said experience with rubber lined tanks has been excellent when fabrication was done by an experienced firm. Type 316 stainless steel tanks are good, except under certain conditions with wet process acids, and cost approximately $1.00 per gallon of capacity, he said; polyvinyl chloride lining is good on vertical tanks but not so satisfactory on horizontal tanks. Loose plastic liners are lower in cost at 25 cents a gallon, he said, and are satisfactory for wet process acid storage when used in an open-top or top access-hole style to provide for cleaning. Pillow-type rubber tanks are okay for transport, he added, but experience with their use for storage is limited. Most economical, at five to ten cents per gallon capacity, is the pool-type storage, built up of laminated asphalt and burlap on a screen base, Dr. Batson said, provided ground water problems are avoided and provision is made for drainage. While experience is limited on these units, he stated, they look promising for low-cost auxiliary storage to back up regular facilities.

Commenting on piping, he said that unplasticized polyvinyl chloride is good, low in cost and easily installed. Rubber-lined steel is also good but expensive, he added, and epoxy glass-lined steel and type 316 stainless steel fall into the same general class. As for valves, Dr. Batson recommended a Saunders diaphragm valve with steel or PVC body, 316 stainless steel or teflon-lined plug valves. For pumps he suggested FA-20 alloy or 316 stainless in centrifugals, with rotary gear or positive displacement pumps wherever self-priming or high head is desirable.

As for precipitation from stored acid, Dr. Batson said that agitation was not especially practical since it would have to be continuous, and that periodic cleanout of storage facilities was still the best practice. He recommended that storage tanks be kept from excessive cold by insulation or by location inside a building or by a heat-exchange system diverting part of the acid back to the storage reservoir. Regarding deposits in piping, he stated that with 1½" and 2" pipes in normal use there were no problems. Where slow feed or standing occurs, deposits may take place, he said, but cleanout can be effected by flushing with warm water or dismantling and physically cleaning the system. He suggested that where air unloading is used in car-to-process operations, and the acid destination is uphill or far away, an intermediate pump should be used. In air unloading of a car, when the acid fails to flow due to precipitates in the bottom of the tank, he recommended a blow-back through the dip pipe (after relieving pressure) or dip pipe clearing with the rounded end of a wooden stick.

Answering a question about fiberglass epoxy tanks for storage, Dr. Batson said experience with these materials was very limited. As for use of an internal steam coil and agitation to get precipitated solids back into suspension, he said that erosion, corrosion and leaks from fluorine attack generally ruled against use of an internal coil. He replied to another question that they had no experience with use of an agitator in a loose bag-type tank liner.

Triple Superphosphate

Frank Neilsson of International Minerals & Chemical Corp. led a panel discussion on triple superphosphate, with emphasis on its behavior in mixed fertilizer formulation. He reported that production of triple super had registered a gain of 1820% in 20 years, to a total of 800,000 tons in 1959. Mr. Neilsson predicted that triple super production would continue to climb, while normal super declines, until the two tonnage lines intersect at about a million tons of each per year.

Joe Markey of Tennessee Corp. placed the annual consumption of P_2O_5 at 2½ million tons in all carriers, and cited figures to indicate that phosphatic materials are registering a steady increase. In a decade of revolution that has seen high analysis mixed goods, continuous processing and new materials growing at an unprecedented pace, he said that both the materials manufacturers and the fertilizer mixers have responsibilities to minimize the problems that this rapid growth brings. The manufacturer must be responsible, he said, for the chemical and physical properties of the materials shipped: analysis, particle size, moisture content, porosity and free acid content. On the other hand, the mixer must assume responsibility in the form of operational control: physical handling and process control.

Illustrating both with slide projections, Mr. Markey showed graphs of the efficiency of ammoniation of triple superphosphate by particle size, by moisture content, by temperature and by ammoniation rates.

Charlie Franklin of International Minerals & Chemical Corp. got into some specific recommendations

about ammoniation of triple superphosphate. He outlined the effect surface area plays, both in the form of particle size and of porosity. He recommended a moisture content of 3% for best ammoniation, and suggested that a temperature of 150°-160° produces best reaction, while a four minute retention time is preferable if the product is being dried. Overagglomeration reduces ammoniation rates, he reminded, and bed density and temperature are two other important factors; recycle is a big help in reducing excessive liquid phase. Sparger location and design must not be overlooked, either, he added.

Dan Walstad of American Cyanamid Company said that while you can't overcome the difficulties of a material with poor ammoniation properties, quite often attention needs to be given to the equipment with which the material is being ammoniated. He called for close attention to sparger design, so that it offers minimum resistance to the bed of materials and forms a good distribution pattern through its full length—which should also be carefully considered. The sparger should be located close to the mixer shell, three or four inches away, he recommended. Speed of drum rotation should be given attention, he said, being as high as possible up to a critical speed of 40°, which is 13 or 14 r.p.m. in a 7' diameter drum with sparger under the bed.

Length of drum is important, too, Mr. Walstad stressed, and often an ammoniator drum will do better if the dam is removed to increase the effectiveness of the liquid phase.

Above all, he cautioned, equipment difficulties should be corrected before changing a formulation. If a formula adjustment is necessary, he suggested ways of going about it and illustrated with five variations of a 5-20-20 formulation.

Frank Neilsson wrapped up the triple superphosphate discussion with a closing remark that this material improves the physical condition of a mixture when compared with grades made using phosphoric acid only.

A question about ammoniation rates in pan granulators versus conventional TVA-type ammoniators produced a response from the floor by Gus Mautner of Baugh & Sons Co., who said that the same degree of ammoniation couldn't be accomplished in the pan granulator, but low nitrogen grades granulated well at less than 100° in the pan process with 95% on-size particles.

Diammonium Phosphate

Al Phillips of Tennessee Valley Authority described their experimental work with production of diammonium phosphate in an ammoniator with wet process phosphoric acid. Pointing out the process on a flow diagram of the pilot plant, he told of producing 21-53-0 with furnace acid and 18-46-0 with wet process acid, and of making 16-48-0 with two thirds as diammonium phosphate and one third as monoammonium phosphate. While most work has been confined to diammonium phosphate alone, he said several complete fertilizer grades with high diammonium phosphate content have been produced, 14-35-14 and 18-18-18 among these. The after-storage condition of these materials has been good thus far, he concluded, but further study is being carried out.

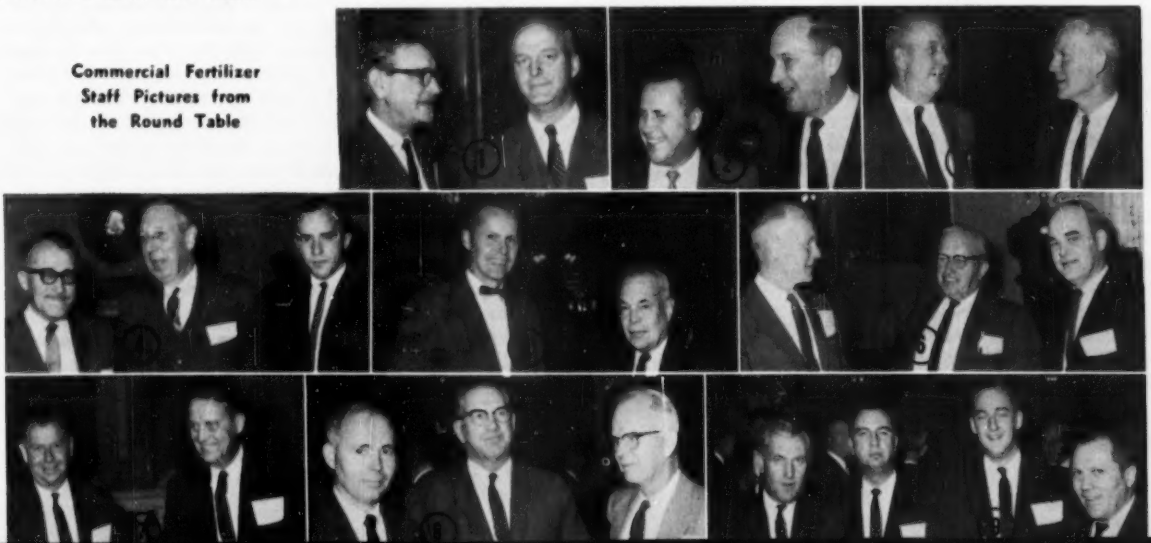
PEC Process

Clem Giles of Ortho Division, California Chemical Corp., outlined the use of the PEC process to produce nitrophosphate complex fertilizers at their two plants. Drawing a flow chart, he illustrated how one, two or three reactors are placed in use, depending on the grade being produced and the rate of production desired. The first plant, placed in operation at Richmond, Calif. in 1955, uses the straight PEC process beginning with nitric acidulation of phosphate rock, ammoniation, then granulation. With this process, he said, they are able to make almost any high analysis complex goods deriving practically all the P_2O_5 from phosphate rock, and producing no nitrites. A slurry is fed from the reactor to the dryer, to a pugmill then to sizing screens. The process has been modified at the Kennewick, Wash. plant which came on-stream early this year, Mr. Giles pointed out, to use the new Chemical & Industrial Spherodizer in place of the regular PEC dryer and granulator; this has eliminated high recycle. The spherodizer sprays the slurry onto recycled fines until an on-size particle emerges. At Kennewick a 1:1 recycle rate is used, and he feels their next plant will probably employ a 2:1 recycle. (Ortho has broken ground at Ft. Madison, Iowa for a similar plant.)

Their units can produce 16-48-0, or 20-20-0 or 20-10-0 at 200 tons a day, or 14-14-14 at 300 tons a day. In the 1:1:1 ratio 10-15% of the P_2O_5 is water-soluble and 85-90% citrate-soluble. One to two percent of a

1. Gene Van Deren, Bluegrass Plant Foods, Cynthiana, Ky., and Bob Linderman, Davison Chemical Div., W. R. Grace & Co., Baltimore.
2. Barney Tatum, U. S. Phosphoric Products Div., Tampa, and Tom Hoshall, Farm Fertilizers, Omaha.
3. Harold Krueger, Stedman Foundry & Machine Co., Aurora, Ind., and Elmer Perrine, Allied Chemical Corp., Nitrogen Div., New York.
4. Walter Sackett, The A. J. Sackett & Sons Co., Baltimore; Dudley George, Richmond Guano Co., Richmond, Va.; Walter Sackett, Jr., The A. J. Sackett & Sons Co., Baltimore.
5. Al Phillips, TVA, Wilson Dam, Ala., and Charlie Goodale, Commercial Solvents Corp., Terre Haute.
6. Elmer Perrine, Allied Chemical Corp., Nitrogen Div., New York; T. J. Bosman, Federal Chemical Co., Nashville, Tenn.; and Bill Tucker, Coop. G.L.F. Exchange, Ithaca, N. Y.
7. Nitrogen panelists Joe Sharp of Spencer Chemical Co., Kansas City, and Bert Tucker of Sohio Chemical Co., Lima, O.
8. Tom Nixon, Ashcraft-Wilkinson Co., Atlanta; John Mark, Farm Bureau Coop. Assn., Columbus, O.; and John Hardesty, U.S.D.A., Beltsville, Md.
9. Clare Craft, Ketona Chemical Corp., Birmingham, Ala.; Jim Sullivan and Steve Janovac, W. S. Tyler Co., Cleveland; and Bob Sachtschale, Northwest Cooperative Mills, Green Bay, Wis.

Commercial Fertilizer Staff Pictures from the Round Table



coating agent is used on the 14-14-14. As used in most European installations, the PEC process is extended to removal of calcium nitrate so that a high-analysis 18-18-18 grade can be made, Mr. Giles said, but Ortho merely converts the calcium nitrate in the process to ammonium nitrate and dicalcium phosphate.

Phosphate Summary

K. D. Jacob of U.S.D.A. summarized the phosphate session, expressing pleasure that the industry can now come together as a group to discuss processes and problems. To see the progress this has brought about, he suggested looking "not at where we are today, but at where we **weren't** several years ago." He traced the development of phosphatic materials from the turn of the century, stating that superphosphate's only real competitor until 40 years ago was basic slag. He told of the early triple superphosphate plants in the U.S., one established by Virginia-Carolina Chemical Corp. at Charleston, S. C. in 1907 and operated until this decade, and another operated by Anaconda Copper Co. in Montana from 1920 until just last year. He told of two others, one in Alabama and one in North Carolina, which were established in the 1920's.

He outlined the beginnings of U.S. ammonium phosphate production by American Cyanamid, mostly for export, during the twenties, and of German nitric phosphates in the same decade which were imported into this country.

Only since World War II, and especially since 1950, have other materials begun to break superphosphate's hold in the U.S., Dr. Jacob stated, and phosphoric acid has made a sharp rise in the past five years. With ammonium phosphates, nitric phosphates and other complex fertilizers gaining acceptance, he concluded, "The future is anybody's guess."

Materials Standardization

H. L. Marshall prefaced the session on standardization of raw materials with a few remarks about the reasons for wanting uniformity. He said that we must have uniformity of expression to get a language that we can go by in business. He said the customer should know the method the supplier used in determining moisture and free acid content of materials, in order to get at the age-old problem of analysis. He introduced **Eleanore Kanar** of Agricultural Chemicals, who presented results of a survey on methods used to: determine moisture content of materials and mixed fertilizers; express and extract free acid content; prepare samples of materials and of various fertilizers; screen goods for particle size; prepare and reduce samples.

Wayne King, W. S. Tyler Co., made a plea for standardized nomenclature in sieve screening and multiple gauging.

Users Panel

A users panel followed, with these members giving some sound reasons for standardization: Rodger Smith of Eastern States Farmers Exchange; Ed Kingsbury of Kingsbury & Co.; Eugene Reichard of Robert A. Reichard, Inc.; Gus Mautner of Baugh & Sons Co.; Grayson Morris of Cooperative Fertilizer Service of Richmond; and Bill Jones of Northwest Cooperative Mills.

Rodger Smith led of with the statement that standardization is a very necessary step in the development of the fertilizer industry from a scavenger business to a full-fledged chemical process industry. Without proper communications between supplier and mixer, and without standard units and methods of measurement, the mixer must continuously overformulate his goods in order to avoid the bad publicity of shortage listings in the control officials' published reports. And this, he said, is bad publicity for the whole industry.

Among the failures in quality control, Dr. Smith cited lack of uniformity in ingredients, lack of information on ingredients, improper ammoniation practices, segregation and operating errors. These, he said, are caused by: undue averaging; financial losses on ingredients by striking such averages; calculating too high on ingredients by assuming too high an average; necessity for undue overages costing one to two dollars a ton; and inability to match particle size. These result in a less uniform product, both chemically and physically, he concluded, stating that much of the trouble could be avoided if suppliers would set up specifications, hold uniformity within specified tolerances, and furnish customers with proper information.

Ed Kingsbury said that before we could discuss standardization of materials, we must first ascertain what products are most advantageous, considering production, costs, and homogeneity of end product. Then, if we can justify our selections and get together on recommending changes desired, standardization should be no problem.

He discussed the merits and shortcomings of various potash particle sizes in production of different granular grades, and spoke of the effect equipment and process control can have on materials selection.

Mr. Kingsbury outlined some of the specifications preferred at their two plants, and gave tangible reasons for the preference. He commended potash producers for the apparent uniformity in their coarse grades, and urged triple superphosphate producers to improve their run-of-pile product, using an expression that was often repeated through the remainder of the meeting. Describing screen analysis on a recently-received car of R.O.P. triple, he said that 60% passed through a 35 mesh screen and added "It's too bad we didn't have a 325 mesh screen at the time . . . If the Vice-Presidents in charge of triple production were required, as a part of their training, to unload one of these cars, I'm sure changes would be made very rapidly." He suggested that the extreme fines be removed just prior to shipment.

Eugene Reichard called for better control of materials coming into the small plant, describing their Allentown, Pa. operation as a small operation producing granular, pulverized and liquid fertilizers. He described trouble with superphosphate and even more trouble with triple super, stating that analysis tests of incoming materials reached the plant three days to a week after receipt of the shipment. This necessitates a .3% overformulation of nitrogen, and taking P_2O_5 and K_2O values on the low side to protect themselves, he said. Mr. Reichard, on the topic of phosphoric acid, described a rubber-lined, cone-bottom vertical storage tank which they use, with the acid take-off valve at the upper edge of the cone and a cleanout valve on the bottom tip.

Gus Mautner asked suppliers to furnish enough information on the shipment by the time the car reaches the plant so that "we know what we're using and how to formulate," and so we don't have to "crab continually." He cited that in Indiana and Ohio, as high as 50% of the 12-12-12 samples and 80-85% of the 16-8-8 samples showed nitrogen deficiencies. Names for the various grades of potash and triple superphosphate are fine, he concluded, so long as they are backed up with figures.

Grayson Morris felt that segregation is the greatest problem, and cited one control official's report for

1959-60 that 8.6% of the samples collected were deficient, a 44% increase over the preceding year. He called attention to the fact that some control officers are using selective sampling now, especially in the high analysis grades, where samples are collected in relation to the number of violations by that mixer rather than by tonnage produced.

Bill Jones, summarizing the users' panel, asked the suppliers to sit together in a 'constitutional convention' to set standards, and to adhere to them once they are set. "Decide what specifications you with your plants can realistically set," he urged, and stay away from exotic names . . . let the name describe the product.

Materials Producers' Panels

Materials producers had the opportunity to get their comments across in the form of panels dealing with standardization, too.

Liquid Nitrogen

Bert Tucker of Sohio Chemical Co. traced development of the need for standardized nomenclature, pointing out that ten years ago there were only four ammonia-ammonium nitrate solutions and two urea-ammonia solutions on the market. He described the work of the committee which National Plant Food Institute was instrumental in organizing and which developed the standard nomenclature and designations now accepted by most nitrogen solutions producers.

The greatest remaining need in this field, he continued, is for standardization of the nomenclature of physical properties of solutions. He further suggested that producers could reduce the number of solutions by eliminating some minor differences. Noting a trend toward some universal solutions, he predicted that we may see the day when the larger fertilizer manufacturers will use only one solution and blend it with anhydrous ammonia to fill specific needs.

Joe Sharp of Spencer Chemical Co. presented slide projections on solution identification, outlining vapor pressures, handling characteristics, and other physical and chemical characteristics affected by varying the components. The 32 solutions which he described account for 98% of the solution use in solid fertilizer production, he noted.

Solid Nitrogen

Charlie Waters of Allied Chemical's Nitrogen Division reviewed the properties of ammonium nitrate, ammonium nitrate limestone, ammonium sulfate, sodium nitrate and urea, and detailed the conditions under which each is useful in mixed fertilizer manufacture.

D. F. Sedlack of United States Steel Corp. spoke principally about ammonium sulfate and what steps have been taken in recent years to improve its physical and chemical characteristics, and touched briefly on the improvements which have been made in ammonium nitrate products.

Phosphatic Materials

Al Spillman, pointing out that suppliers are trying to help as much as they can, introduced a panel on phosphatic materials.

Ed Carnell of W. R. Grace's Davison Chemical Division moderated the phosphate forum, which was composed of Barney Tatum of U. S. Phosphoric Products Division of Tennessee Corp., Dan Walstadt of American Cyanamid Co., Bill Harwood of International Minerals & Chemical Corp., Ray Jones of Armour Agricultural Chemical Co., and Tom Pierce of Swift & Co.

Mr. Carnell summarized the most important components of the phosphates 'problem' as: varying available phosphoric acid, varying moisture, what new compounds are formed on ammoniation, free acid content, trace element compounds present, and particle size. All these can be controlled better, he admitted, but it is questionable whether the customer would be willing to pay the price these controls would demand.

Tom Pierce dealt principally with particle size, and reviewed the limitations imposed by a material supply that varies both geologically and chemically. He also called attention to opposing factors in the phosphate materials characteristics called for by many fertilizer manufacturers: as an example, the desire for good porosity, which lends a particle to easy fracture in handling and therefore arrives with a higher percentage of the 'fines' about which several of the users' panel had commented.

Bill Harwood described efforts to obtain closer car-to-car uniformity of analysis on triple superphosphate, and gave a typical range of variation for shipments: 2-5% phosphoric acid, 63-73% monocalcium phosphate and dicalcium phosphate, 13-18% iron and aluminum phosphate compounds, 2-6% unavailable phosphates (unreacted rock) and calcium sulfate, 3-6% sulfur, and 3-6% moisture, free and fixed.

He pointed to process, curing and handling factors which affect the analysis. Process factors included rock composition (affecting both the acid and the triple), acid composition, metering equipment and disintegration efficiency. Curing factors included length of time, depth and length and size of pile, climate, temperature, and location in the pile. Handling factors included equipment and shipping.

Exact controls, concluded Mr. Harwood, are not presently possible nor economically feasible, although all producers are working in this direction constantly.

Ray Jones dealt principally with moisture variations in superphosphate shipments. It is more the day-to-day or car-to-car variation that gives the user difficulty than the seasonal variation, he said. These shipment variations occur by time of day, weather, and position of the shipment in the pile, he pointed out. Rock alone can vary one BPL car-to-car, he continued. While some of these conditions could be improved by the producer's adding 50-75% to his storage facilities, he described this as an expensive step which would push the cost per unit of P_2O_5 to a higher level.

Dan Walstadt showed a number of process control measures which are being used, and told of continuing steps to improve control through more accurate metering equipment, better methods of evaluating acid and rock, and better analysis of products.

Barney Tatum stressed the properties and use of modified diammonium phosphate. He described it as being relatively stable at high temperatures, up to 275°, and retaining its water solubility. Nitrogen loss was minor even when the material was held at that temperature for an extended period, he revealed, and there was a reduced heat load in the granulator. This N-P grade is more subject to particle size reduction in a granulation system, he said, as the surface tends to go into solution, pick up dust and harden, building up a laminated granule. The same process is evident in semi-granulation, he stated, but to a lesser degree.

W. L. Hill of U.S.D.A. described a changing attitude on the part of firms producing phosphatic materials, and told how several had cooperated with him by furnishing records of their shipments so that he could study the standard deviation from each plant's average through the year. He noted the average and deviation for several plants on a blackboard, recalling ex-

act figures with amazing accuracy.

Potash

The potash suppliers were represented by a six-man panel, moderated by Ed Kapusta.

Nelson Wendt of American Potash and Chemical Corp. described his company's development of new grades during the past year, and told of their work to overcome problems with friability, which they are well on the way to licking. He revealed how their new evaporating plant had increased production and improved product quality.

Doug Bourne of Duval Sulphur and Potash Co. outlined their flotation process for refining potash. He recalled that eight years ago efficiency of recovery was the most important production factor, but changing demands have made that take a back seat. When demand for granular material first appeared, he said, it could be met by simply skimming off the larger fraction of the product and shipping it. However, as the demand grew, he told how other measures were taken and how his firm initially used the Allis Chalmers compacter to produce coarse material from the finer fractions. Although he felt that his company's shipments were consistent enough, with a 60.9% K_2O analysis plus or minus .2% on a day-to-day or car-to-car basis, Mr. Bourne expressed an anxiety to join with other producers in standardizing nomenclature of potash products.

Bob Heck of International Minerals & Chemical Corp. used color slide projections to detail the specifications of his company's potash products, covering muriate of potash, sulfate of potash, and double sulfate of potash magnesia.

Dean Gidney of Potash Company of America told how the development of high analysis fertilizers had led to acceptance of muriate of potash in place of the manure salts previously used, and how granulation then led to the physical conditioning of the muriate. New grades had to be developed that fell in between the standard which had been used for mixing and the granular which had been used for direct application. He described their production of floated, fused, compacted and some crystallized product, and expressed a willingness to produce whatever kind of product the industry wants.

Ed Kapusta of U. S. Borax & Chemical Corp. outlined their potash refining process, the bulk of which is by crystallization, and the remainder by tabling and flotation. He told of the check of screen analysis on each car shipped, and how conditioning agents are used to improve the handling characteristics.

Instrumentation

A panel on communication problems in instrumentation dealt with case histories and new developments in selection, operation and maintenance of control devices.

Al Simmons of Fisher & Porter Co. used a cartoon slide projection series to bring out pertinent facts about the installation, maintenance and operation of their magnetic flowmeters, and to illustrate the principles of the device.

Bill Strauss of the Foxboro Company stressed the inherent inaccuracies of grab-sampling and brought out the advantages of automatic control over process adjustments. In the efficient plant, he said, a centralized control panel has become a necessity, and he recommended dust-free air for the control room. He pointed to the instantaneous control that continuous in-line instruments provide as compared with a lab analysis of product.

Among the most critical additional needs for fertilizer plants today are instruments to measure moisture content of materials and products, and nitrogen content of products on a continuous basis, he concluded.

Don Warren of BIF Industries' Omega Machine Division described the continuous processing solids measurement problem as largely one of variations in bulk densities. He cited a specific example of samples from a lot of superphosphate weighing 45.5 lbs./cu. ft. loose and 54.5 lbs./cu. ft. packed, and told of other batches where the range was from 50 to 60 lbs. and from 65 to 79 lbs. He contrasted the variable-speed belt having a constant load per foot of belt method with the constant speed and variable load method, and recommended the first method as the better, since it gets maximum use of the belt.

Mr. Warren had some recommendations designed to help the user extend the service life of weigh-feeders: power operation of the flow gate, use of stainless steel at critical points, and maintenance of the shear-pin rather than replacing it with a non-shear makeshift. In installing feeders, he suggested picking a location that: avoids excessive vibration, keeps the feeder from being directly over the ammoniator, and affords service accessibility. For calibration of the units the distance-weight-time method as a simple but accurate plan, he said.

William Law of Minneapolis-Honeywell presented some instrumentation and control ideas. He recommended control of the ex-dryer air temperature to plus or minus 5°F. A thermocouple at the duct can be coupled to a 0-600° recorder, can control throttling of the burner, and can have a high-limit set point, he said. He also suggested investigating the installation of an ultraviolet flame detector to detect burner cut-off.

Automatic Sampling

Frank Neilsson of International Minerals & Chemical Corp. spoke on sampling techniques and equipment. Illustrating his talk with color slides, he centered his remarks principally about selection, design and proper use of sampling tubes and rifflers.

Nitrogen Losses

Ed Glocker of W. R. Grace & Co. approached the problem of nitrogen losses in drying, which have been estimated as high as $2,000,000 annually for the industry. He described a series of experiments at several plants that measured dryer input versus dryer output nitrogen content. He showed a detailed statistical evaluation of the results, measuring nitrogen as a percent and measuring nitrogen in relation to P_2O_5 and K_2O individually. His general conclusions were that the search for nitrogen losses should be centered somewhere other than the dryer.

Preneutralization

The tremendous interest aroused by the panel on preneutralization at the 1959 Round Table prompted a repeat performance at this session. Five panelists participated.

Grant Marburger of Spencer Chemical Co. described a preneutralizer in use for two years at Farm Fertilizers' plant in Omaha. He showed pictures of the unit, which has produced some 8-10,000 tons of goods to date. He detailed procedure used in production, at 12-15 t.p.h., of 16-20-0, 15-15-0, 15-15-15 and 20-10-5. The latter was initially formulated with 19 units of N from solution, he said, but the granules were soft and tended to pile-harden; this was corrected with use of three units of nitrogen from ammonia and three units from ammonium sulfate. Overformulation by one unit of N is practiced. Careful check is kept on pH as it affects granulation and storage qualities. Mr. Marburger described the cooling as troublesome, due prin-

cipally to the fact that it is inadequate.

R. D. Young of T.V.A. reported on a small preneutralizer used at the T.V.A. pilot plant. Spargers were originally concentric pipes at the side of the tank, but the reaction was localized and violent, he said, and the present unit has circular spargers at the bottom of the vessel, with holes directing the stream toward the center, and an agitator is used. A pH check is maintained with narrow-range pH paper on a 4:1 diluted slurry. Temperature is maintained at 275° by water control.

The preneutralized slurry is fed on top of the dry materials bed in the ammoniator-granulator, Mr. Young said, and good distribution is effected with a saw-toothed distributor. Grades run include: 13-39-0, with all the N from solution; 16-20-0, with 14 units from solution; 20-10-10; 16-0-16; and 20-0-20.

Mr. Young felt that preneutralization is very desirable, as one-half to two-thirds of the water and half the heat are liberated before the material enters the ammoniator.

Harold Garrett of Minute Maid Groves Corp. outlined their experience with the preneutralizer installed at their plant, where the principal grade is 14-0-7 with six units of magnesium, all the nitrogen being derived from solution. During the initial year, he said, there were times when he was happy theirs was a captive market. While the capacity of the unit is 20 t.p.h., production is generally held to 10 tons. The preneutralizer tank top was originally open, but a bolt-on cover with a hole for fume escape has been added, he said, and a 1200 r.p.m. agitator is used. Starting with 66°Be. acid, they have changed to 60°Be. Also changed is the sparger arrangement, with acid fed through a Hastelloy C sparger into the center of a horseshoe-shaped type 316 stainless steel solutions sparger located flat at the bottom of the tank. Their pH control is simply observation of the stack plume, and they hold a maximum level of .5% excess acid. Fume is a problem despite their rural surroundings, Mr. Garrett said.

George Gilliam of Allied Chemical's Nitrogen Division had some practical suggestions in design and operation of preneutralizers. Illustrating his talk with a design drawing, he recommended installation of a thermocouple controlling an automatic water feed valve. On startup, he suggested covering the spargers with water, then opening the acid and solutions valves slowly and simultaneously. On shutdown, he said water should be fed through the solutions line and the bottom tank valve should be flushed. Also, he added, careful attention should be given to operating variables such as temperature and fixed-to-free nitrogen in solutions.

N. K. Alfrey of W. R. Grace & Co. told of recent improvements in the units installed in their Davison Chemical Division plants, which use a concentric-pipe pre-reactor outlined in the panel session last year. The changes include by-passing part of the acid to the pugmill mixer on startup of high-K grades, and use of a block sparger to distribute the slurry in the pugmill. The latter avoids the periodic air-purge they formerly used.

Business Meeting

At the informal Round Table business meeting, registration was pegged at 425, slightly above last year's attendance. Included were two registrants from Australia, one from England, and a number of Canadians in addition to the record crowd of U. S. industry members.

H. L. Marshall announced that copies of the 1960 proceedings would be printed in January, and placed the price at $3.50 to $3.75 per copy.

The group voted to hold the 1961 meeting at the Mayflower Hotel in Washington, D. C. again, and approved the dates November 8-10.

More CF Staff Photos from Round Table

1. Rufus Roberts, Raymond Bag Corp., Middletown, O., and George Walton, Tennessee Corp., Cincinnati, O.
2. Ray Yates, Ashcraft-Wilkinson Co., Atlanta; Allen Dow, Texaco Inc., Chicago; and Jack Sadler, Davison Chemical Div., W. R. Grace & Co., Baltimore.
3. Charles Leonard, American Cyanamid Co., Marshall, Mich.; Phil Stocker, Land O'Lakes Creameries, Minneapolis; Dan Walstad, American Cyanamid Co., New York; Clyde Kennedy, American Cyanamid Co., New York; and Chet Johnson, Land O'Lakes Creameries, Minneapolis.
4. Joe Prosser, Joseph L. Prosser Co., Glenarm, Md., and Stanley Schaefer, Wisconsin Farmco Service Coop., Madison.
5. Ben Kirby, Allied Chemical Corp., Nitrogen Div., Atlanta; Harold Garrett, Minute Maid Groves Corp.; Dr. Phillips, Fla.; and Al Henderson, Wilson & Toomer Fertilizer Co., Jacksonville, Fla.
6. Gus Mautner, Baugh & Sons Co., Baltimore; Ernest Kontz, Davidson-Kennedy Co., Atlanta; and Joe Whittington, Olin Mathieson Chemical Corp., Baltimore.
7. Willis Buie, Canada Packers, Toronto; Russell Davis, Olin Mathieson Chemical Corp., Norfolk; and James E. Clark, Bradley & Baker, New York.
8. Al Phillips, TVA, Wilson Dam, Ala., and Herbert Bailey, Moores Lime Co., Springfield, O.
9. Walter Horn, Farmers Chemical Co., Joplin, Mo.; Tom Pearce, Swift & Co., Bartow, Fla.; R. D. Young and Frank Anderson, TVA, Wilson Dam, Ala.
10. John Hardesty, USDA, Beltsville, Md.; Bill Chapman, Consolidated Rendering Co., Boston; and R. Renaud, Lowell Rendering Co., North Billerica, Mass.
11. Jim May, AFC, Inc., Edison, Calif.; Allen Jackson, Fertilizer Equipment Sales Corp., Atlanta; and John Sturgess, Collier Carbon & Chemical Corp., Los Angeles.
12. Walter Whitlock, Texaco Inc., Chicago, and Archie Slack, TVA, Wilson Dam, Ala.

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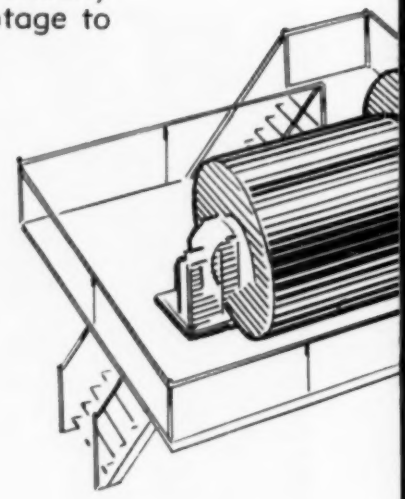

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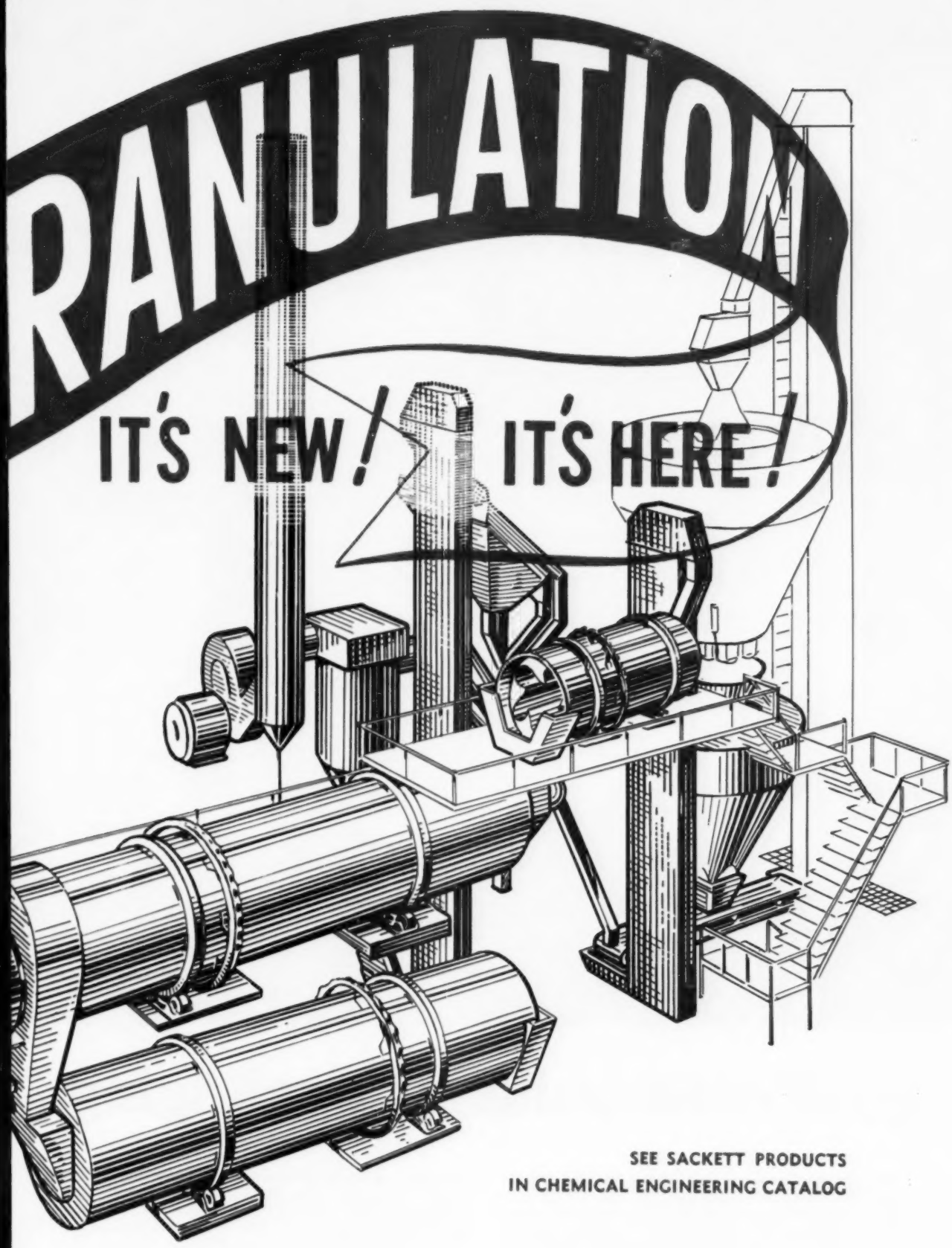

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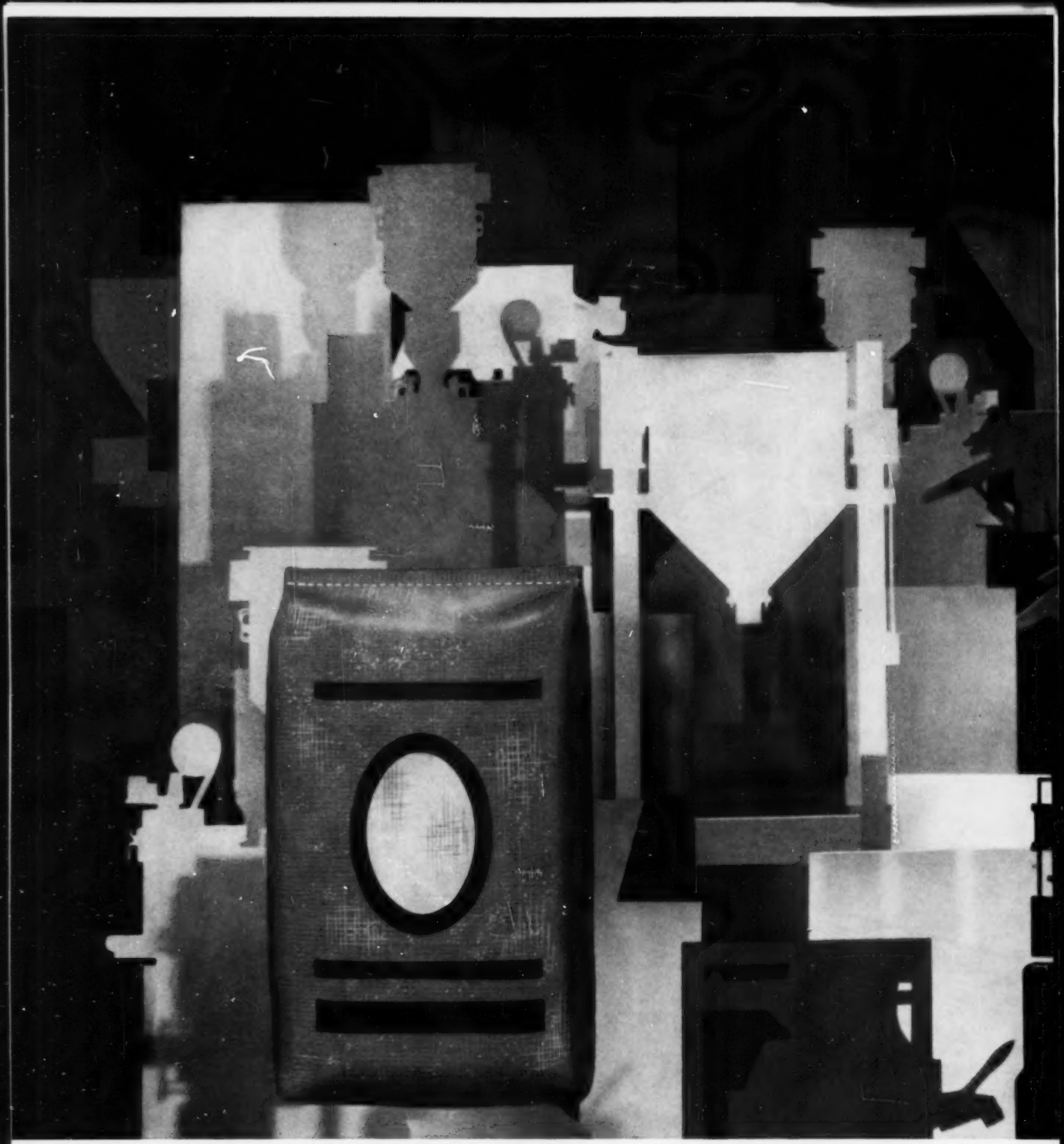

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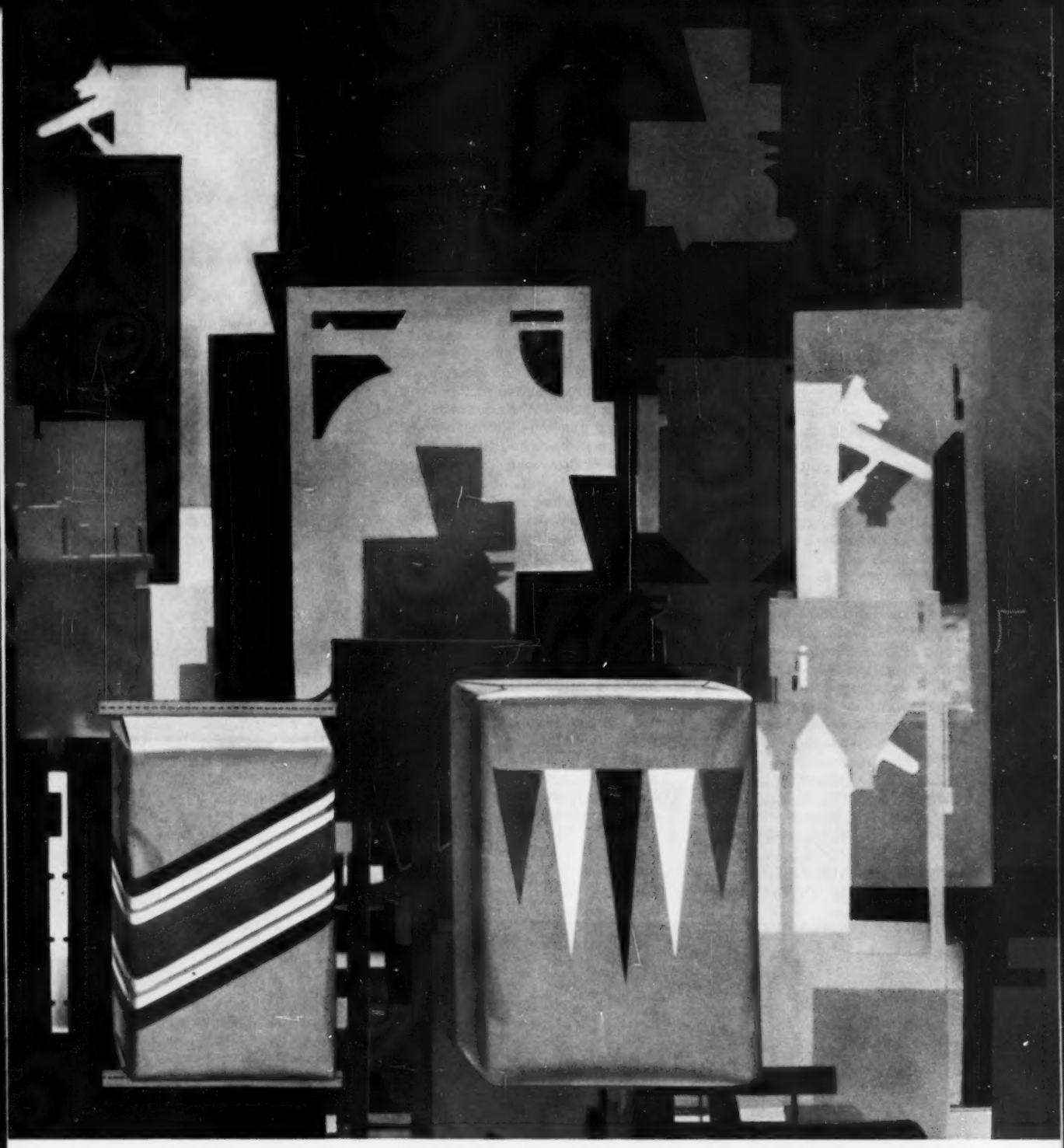

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Solutions Men plus Enthusiasm Equal Successful Convention

National Fertilizer Solutions Association held its largest and most active convention at Memphis, Tenn. November 9-11. Registration reached 537, and indications were that a number of unregistered guests attended.

The enthusiastic crowd jammed every business session and spent its off-hours busily probing around the conference rooms of 41 industry suppliers who exhibited at the convention.

At the opening business session, NFSA President Hugh S. Surles, Jr., Planters Cotton Oil & Fertilizer Co., Rocky Mount, N. C., reported that membership had reached 248, a net gain of 48 in the past year, and more than four times the membership at the initial convention in Sioux City in 1956. Since the 1959 convention the general fund has been doubled, he added.

Following the theme that there is nothing wrong in making a profit, Mr. Surles urged the members to pursue this economic motive relentlessly, but to temper it with fair competition. Profit is not only the opportunity of the businessman, he concluded, it is his responsibility and duty.

General Convention Chairman John L. Wilson of Sangamon Grace Ammonia Company, Decatur, Ill. reviewed the program and urged delegates to take full advantage of it, as it was designed to serve them.

Eddie Crouse of C. D. Liquid Fertilizer Co., Liberty, Ind., chairman of the Nominating Committee, proposed a list of new directors, which was approved unanimously. (See cutlines under photo of new officers for list of new directors.)

Rhoton Cross of Farmers Elevator Co., Oakville, Ind., chairman of the insurance committee, announced a new plan offered through the association to provide low-cost group insurance for members and their employees. The plan as outlined will provide life, accident, hospitalization and surgical benefits.

Scott Hall, inspector for the Indiana fertilizer control office, explained a new sampling device for liquid fertilizers, especially developed to collect a representative sample through the depth of a tank of goods that tend to segregate by settling. The plastic bottle, suspended on a stainless steel chain and holder, will be used by six or eight cooperating states.

Earl McNew of Allied Chemical's Nitrogen Division, Indianapolis, showed a slide film and narrative series—"All the Same, Only Different"—developed for the association, which promotes liquid fertilizers. To be sold to members at $25.00 a set, the series is designed so that local slides can be substituted at key points. Featuring a theme that the difference is all for the better, the series points out that machinery — not men — does the heavy work, and that immediately available nutrients give quicker response.

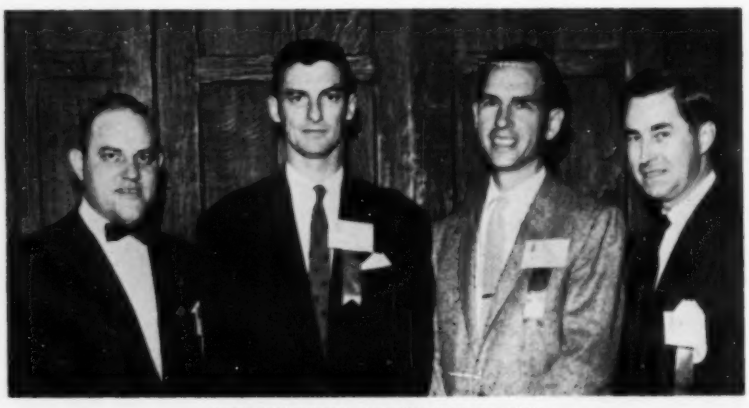
Roswell 'Bob' Garst, Iowa farmer who hosted Nikita Khrushchev on his U.S. visit, urged the fertilizer industry to sell the economy of purchased nitrogen, as the farmer can buy N at one-fifth the cost of raising it. Saying that he spends as much for nitrogen on pastures as for N on crops, and gets at least as much out of it, Mr. Garst reviewed his feeding program for 2500 cattle: adding urea and dicalcium phosphate to molasses and supplementing it with any crude cellulose. He said that liquid fertilizer manufacturers have the easiest sales job in the world—selling laziness, which "is a pretty popular product"—and that fertilizer-pesticide mixtures are the most undersold product in existence.

The afternoon was given over to conference room visitation, and a riverboat cruise and catfish dinner highlighted the evening.

The next morning's session began with a review panel of four fertilizer industry men, each with a specific topic.

Morris T. Woosley of West Kentucky Liquid Fertilizer Co., Hopkinsville, reviewed engineering developments. Stating that the future of the liquid fertilizer industry is centered around a home base plant with high capacity, surrounded by 'cold-mix' blending stations with service radii of about 30 miles each, he described some aspects of their operation.

He diagrammed the continuous neutralization reactor which operates at 10 to 40 tons an hour with two men. Fed with anhydrous ammonia, water and Florida wet-process phosphoric acid, the reactor is a large-diameter vertical stainless steel tube with five sparger pipes running lengthwise inside it. Am-



NEW SOLUTIONS ASSOCIATION OFFICERS

New NFSA officers are (left to right): Treasurer Edward A. Wex, Badgerland Liquid Fertilizer Corp., Milwaukee; President Donald J. Humphrey, Flo-Lizer, Inc., Kingston, O.; Vice-president Edward O'Nan, Land O'Nan Warehouse, Sturgis, Ky.; and Secretary Edwin C. Aylward, Aylco Chemical Co., Sullivan, Ill.

DIRECTORS—New NFSA directors elected to 3-year terms are: C. I. Graves, Victor Chemical Works, Chicago; G. C. Matthiesen, Allied Chemical Corp., Nitrogen Div., New York; John Dail, General Metals, Inc., Greensboro, N. C.; Lewis DeHart, Sur-Gro Plant Food Co., Mexico, Mo.; R. T. Henry, Rainbow Chemicals Ltd., Tilbury, Ont., Canada; John B. Larkin, Farmers Mill & Seed Co., Jonesboro, Ark.; W. R. Harrell, Tidewater Chemical Co., St. Brides, Va.; Bryce W. Strachan, Southland Liquid Fertilizer Co., Boynton Beach, Fla.; and Paul C. Hughes, Farmers Soybean Corp., Blytheville, Ark.

'MAN OF THE YEAR'
E. E. 'Eddie' Crouse (right) of C. D. Liquid Fertilizer Corp., Liberty, Ind., received NFSA's 'Man of the Year' award from W. Harold Schelm, Schelm Brothers, Inc., East Peoria, Ill. Mr. Schelm was 1959 Man of the Year. This is the third annual award, which was presented for pioneering and continuing contributions to the development of the association. Mr. Crouse is a past president of NFSA, and the first liquid fertilizer manufacturer to receive the award.

monia is distributed by the center pipe and other ingredients are added by the four spargers surrounding it. Two recycle pipes angle into the reactor in a direction that sets up a whirlpool flow inside the unit, and introduce 400 gallons a minute of recycled material to cushion the shock of reaction of the new materials. Metering equipment controls flow of all materials to plus-or-minus .5%. Production rate for 8-24-0 is 40 t./hr. for storage or 30 t./hr. for load-out.

Mr. Woosley said that the blending stations can make 50 different grades. Vertical tanks at each station are equipped with three meters, but the pipes are cross-linked above the meters so that flow can be diverted to another meter in the event of one meter's failure. He illustrated an applicator truck they use which has a boom only to one side, plus a bumper-width distributor tube across the front. Using this unit avoids distribution overlap or missed strips, since the truck track serves as the boom marker.

Claiming liquid application to be more uniform than solids application, he illustrated this point with color slides of several fields where the crop was just beginning to take hold. Mr. Woosley urged getting distribution equipment into the hands of the farmer, who is inclined to be more tolerant of his own application deficiencies than of the failures of the mixer or custom applicator.

John L. Strauss of Ris-Van, Inc., which operates seven liquid mixing plants from its headquarters at Belmond, Iowa, spoke on materials—old and new. He reviewed the historical materials and those in current use. Speaking of 11-33-0, he said the farmers in their area wanted high analysis goods, but when Ris-Van provided them, the farmers weren't excited about it. Urging mixers to experiment with new materials and methods—with vigor and enthusiasm, but with common sense, too—Dr. Strauss spoke of materials which could offer lower-chloride mixtures: potassium hydroxide, potassium carbonate and potassium bicarbonate. He also looked to potassium phosphates and potassium nitrates as materials with potential in the liquids industry, and urged further experimentation with ammonia-urea solutions, chelates, sequesterants and suspensions.

Dean R. McHard of Agricultural Business Co., liquid fertilizer manufacturers at Lawrence, Kansas, speaking on water-soluble phosphates, said that in general agronomists agree that water-solubility is important, but vary on the degree. Citing some studies from the University of Missouri concerning ammonium phosphate and triple superphosphate, he described soil reactions relating to the triple superphosphate. Concluding that liquid fertilizers have the advantage since their P_2O_5 is soluble and available, he told the audience not to take a back seat on the quality of their products, but to stress the advantage of even stands, quicker response and better yields.

Larry W. Galloway, of Baugh Chemical Co., Baltimore, which operates solid fertilizer plants in the East and Midwest, and distributes liquid nitrogen at a number of locations, spoke on the liquid fertilizer market. He said the future is unlimited for the marketing of liquid fertilizers, since they now account for about 500,000 out of 25,000,000 tons annually, or two percent of all fertilizers sold in the U.S. However, there is already existing an additional potential market for 25 million tons, he said, and this is the market on which liquid mixers should concentrate, not the 25 million ton market which already is being sold.

Stating that the principal advantage of the liquids industry is its closeness to the farmer and its ability to be of service, he urged the audience to sell its products at the premium which they can demand due to convenience and manpower savings, rather than attempting to match costs with dry fertilizers. The manufacturer must sell at a fair return plus a profit if he is going

Above: Roswell "Bob" Garst, Iowa farmer who hosted Nikita Khrushchev during his U. S. visit, was a principal speaker. Here he is shown with Hugh Surles, Jr. (center), NFSA president, and Dean McHard, NFSA director.
Below: Review Panel (left to right)—Moderator Ed Aylward, Aylco Chemical Co.; Larry Galloway, Baugh & Sons Co.; John Strauss, Ris-Van, Inc.; Dean McHard, Agricultural Business Co.; and Morris Woosley, West Kentucky Liquid Fertilizer Co.

to replace his equipment and continue to grow, he said, and he must have additional returns when the middle man is eliminated and the manufacturer assumes those functions.

Liquid fertilizer manufacturers have made money on liquid nitrogen, Mr. Galloway said, adding that many have carried their entire business on this profit. Matching a deal isn't selling, he reminded. And selling is simply moving your tonnage, sometimes at a loss of profit, he said, but marketing is something different altogether, and this is the area in which the industry needs work. He described marketing as having to do with people: designing

Above: Looking over some of Professor Hartzler's "Management Practices" speech material are Dean McHard of Agricultural Business Co., Lawrence, Kans.; F. E. Hartzler, Emporia (Kans.) State Teachers College; and C. C. Matthiesen, Allied Chemical Corp., Nitrogen Div., New York.
Below: 'Miss Arcadian', LeAnn Bernard, pinned buttons on W. L. Garrison (left), O.K. Fertilizer Co., Guymon, Okla., and Bill Grimett, Pauls Valley National Bank, Pauls Valley, Okla.

and pricing a product with more customer-consciousness than product-consciousness.

The fertilizer industry has not done a good job in the marketing field, according to Mr. Galloway, and the shortsightedness of the dry fertilizer industry is responsible for the growth of liquid fertilizer manufacturing and dry bulk blending. Bulk blenders can give liquid fertilizer manufacturers as hard a time as the liquid manufacturers can give dry fertilizer manufacturers, he said, and since all are in the same business, they must unite to help the customer if they are going to survive.

F. E. Hartzler, a marketing specialist, concluded the morning session with a talk on management practices. Eight out of ten small businesses go broke in the first ten years, he said, but somebody is going to survive and grow. The chances are in favor of the businessman who gathers, validates and uses market information, he said, and the one who keeps an accurate set of books on his costs, especially direct labor and direct depreciation. He suggested a plan of developing and setting a pattern, then training employees — especially managers — exactly what to do in a specific situation. Get a good basic and fundamental set of standard forms and contracts, then see that they are filled out completely, he advised.

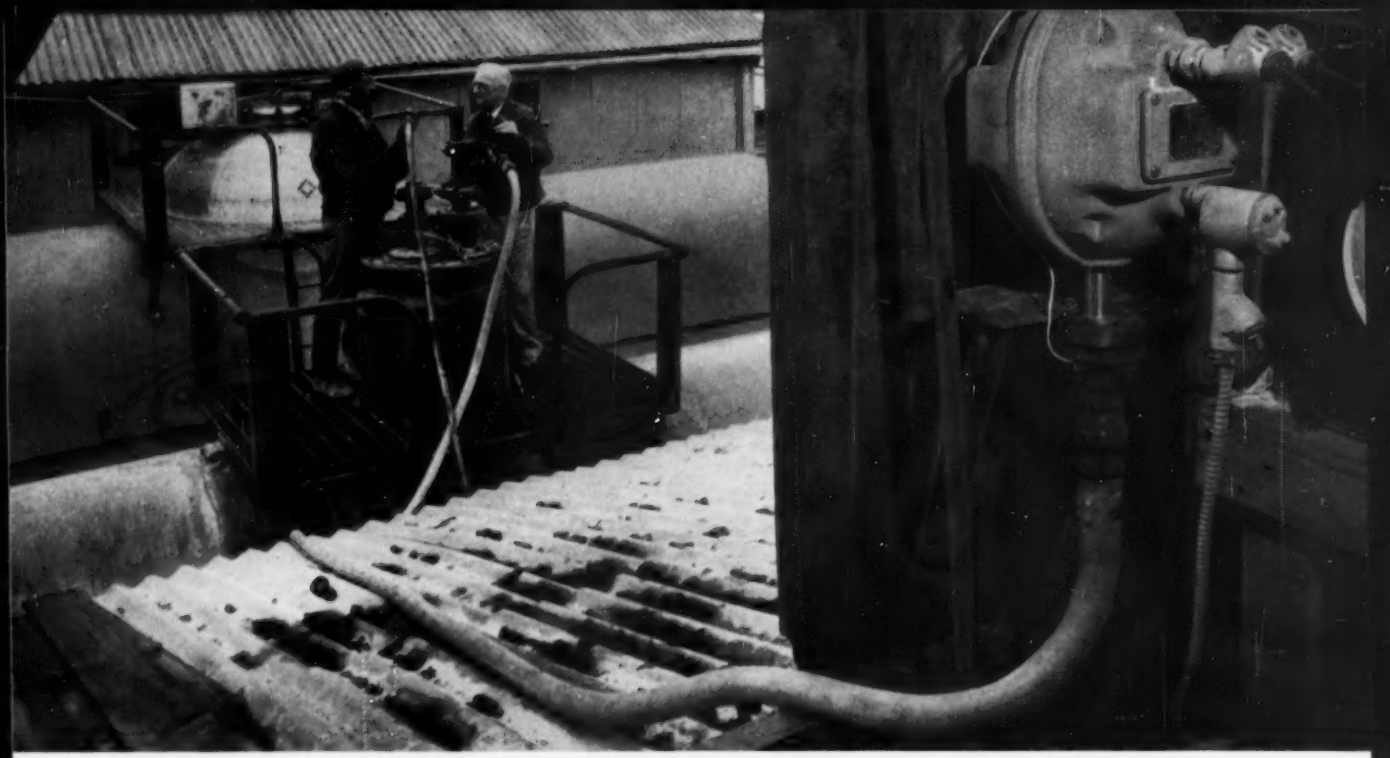
Bob Lemler of Aylco Chemical Co., Sullivan, Ill., opened the afternoon session with some tangible suggestions on "Selling the Farmer."

Earl Nightingale, who became a millionaire by age 35, appeared on the session with an informative and entertaining talk on 'Management's Strangest Secret,' giving some good general pointers on business operation.

Allied Chemical's Nitrogen Division hosted the group at a social hour that evening, preceding the annual banquet.

At the banquet the 'Man of the Year' award was made and the new officers were introduced (see pictures on page 34). The 1961 NFSA convention is scheduled for early November in Chicago.

1. NFSA's 'Man of the Year' Eddie Crouse of C. D. Liquid Fertilizer Corp., Liberty, Ind., and Frank Kennedy, Potash Company of America, Peoria.
2. Competitors keep a sharp lookout as Allied Chemical's 'Miss Arcadian' pins a button on a mixer—(left to right) Al Lehmkuhl, Sohio Chemical Co.; Miss Arcadian, LeAnn Bernard of Memphis; Stanley Smith and Harry Rohlfs, R 'n S Corp., Akron, Mich.; and Jim Rogers, Sohio Chemical Co.
3. Ralph Boynton, U. S. Borax & Chemical Corp.; Clarence Reichard and Eugene Reichard of Robert A. Reichard, Inc., Allentown, Pa.
4. James Feenstra, William T. Martin and Donald Ryan of Haviland Agricultural Chemical Co., Kalamazoo, Mich., and Joe Eckert of Ford Motor Co., Dearborn, Mich.
5. Nelson Clayshute, Agricultural Products, Anthony, N. M., and James C. Tygart, New Ideal Equipment Co., Nashville, Ga.
6. Willis Buie, Canada Packers, Toronto, Ont., and Ray White, Spencer Chemical Co., Kansas City.
7. Bob Peine, Peine Grain Co., Minier, Ill., and Jim Merriman, Merriman Fertilizer Service, Monticello, Ill.
8. Bryce Strachan, Southland Liquid Fertilizer Co., Boynton Beach, Fla.; Fred Henninger, Superior Tank Co., Lawrenceville, Ga.; Harrold Kitchens, Macon, Ga.; and Bob Heck, International Minerals & Chemical Corp., Shreveport, La.
9. Roland Rayburn, Escambia Chemical Corp., Atlanta, and Connie Jones, Jr., Liquid Fertilizers, Inc., Greensboro, Ala.
10. Charles Leonard, American Cyanamid Co., Marshall, Mich.; Ed O'Nan, Land O'Nan Warehouse, Sturgis, Ky.; and Rhoton Cross, Farmers Elevator Co., Oakville, Ind.
11. William J. Barrett, Hooker Chemical Corp., Jeffersonville, Ind.; A. J. Yates, Britz Chemical Co., Fresno, Calif.; and Don E. Stroope, Stroope Chemicals, Waxahachie, Texas.
12. John Moore and Bill Cover, Armour Agricultural Chemical Co., Atlanta.
13. Ralph Wehunt, TVA, Knoxville, Tenn.; C. W. Gantt, Univ. of Ga., Athens; Cooper Morcock, Allied Chemical Corp., Nitrogen Div., Atlanta.
14. Jim Gordon, Cotton Producers Assn., Atlanta; John Dail and Charlie Monnett, General Metals, Inc., Greensboro, N. C.
15. Clarence Gutwein and Lewis Gutwein, Gutwein Agricultural Service, Francesville, Ind.



Cyanamid technical representatives spend thousands of hours every year in our customers' plants working on problems like this one: installation of a meter for measuring phosphoric acid as it is pumped from tank cars.

HIS BUSINESS IS MAKING YOUR BUSINESS BETTER

Like all the men and women in Cyanamid's phosphate operation, his only business is phosphates for your mixed fertilizers

He's one of several hundred Cyanamid people who mine, process, research, deliver and service phosphatic materials for your acidulation and mixed fertilizer business. These people put Cyanamid's more than 40 years of phosphate experience into the kind of products and services you can use. Take advantage of both. Pick up your phone and call your Cyanamid representative.

Services you can use

Traffic Service: Cyanamid traffic specialists are ready to route and ship your orders without delays. Their knowledge can save you money and can make your operation run even more efficiently.

Technical Service: Cyanamid's staff of technical experts are on 24-hour alert. Often, what are new problems to you are solved problems to them. Make your formulation and production problems theirs. That's their job.

Sales Service: Cyanamid sales representatives are available to work with and for you in expanding present markets or in establishing new markets.

Products that serve: Cyanamid's only phosphate business is mining and manufacturing the highest quality products for your mixed fertilizer requirements.

- Florida Natural Phosphate Rock.
- TREBO-PHOS* — Triple Superphosphate.
- Phosphoric acid for acidulation.

To manufacture fertilizers that sell . . . mix with Cyanamid's phosphates and service.

American Cyanamid Company, Agricultural Division, N. Y. 20, N. Y. **TREBO-PHOS is American Cyanamid Company's trademark for its triple superphosphate.*

CYANAMID

PHOSPHATE PRODUCTS

CYANAMID SERVES THE MAN WHO MAKES A BUSINESS OF AGRICULTURE

CALIFORNIA

Valley Nitrogen Producers, Helm, is conducting a member survey, which may lead to superphosphate and other forms of phosphate fertilizers beyond the present anhydrous ammonia, ammonium sulfate and ammonium phosphate production. To satisfy the requests of many members for straight phosphates, according to sparkplug Carl H. Hass, would require only about $250,000 in added equipment for the $9,500,000 plant.

* * *

K. C. Mattson Co., El Monte, report their latest development is a liquid organic, compounded on a liquid fish base, which when applied to plants or trees by airplane or spray rig is at work within the plant in less than one hour. It can also be applied in irrigation water, or injected into the soil.

King Fish, as the product has been named, is reported to produce outstanding root structures and healthier plants quickly and to control nematode attack. It conditions soil, and does not leach from light or sandy soil, they tell us.

COLORADO

Sun-Gro Minerals, Inc., according to general manager Frank Doran, have built in Delta a $100,000 plant to produce soil additives in the form of powder, produced from iron oxide and decomposed sulphur. Sun-Gro recently purchased the mines nearby from which these ingredients are taken, and which are said to include between 3,000,000 and 4,000,000 tons of the oxide in the 100 acre tract.

The mill includes a crusher, roller and mixer—and is dustproof. A 36,000 square foot warehouse is being used as a packaging plant.

DELAWARE

SunOlin Chemical Company, Claymont, recently shipped from their newly-completed plant the cargo of a six million pounds of urea fertilizer to Korea, as part of the "Hands Across the Sea" program of the US Government. The SunOlin plant, owned jointly by Sun Oil Co. and Olin Mathieson Chemical Corp., has a capacity of 73,000 annual tons of urea, and is a major east coast producer.

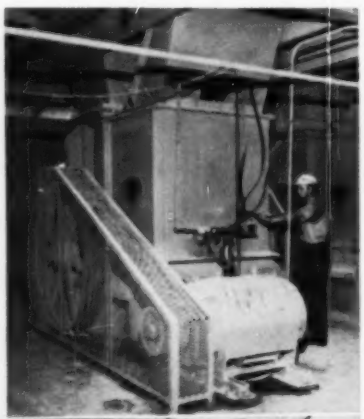
FLORIDA

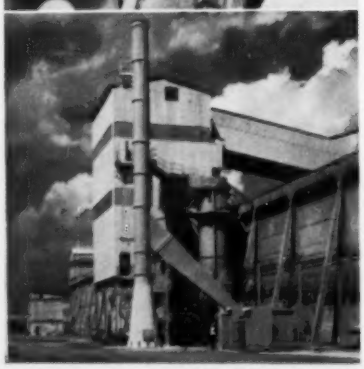
American Cyanamid has revealed details of the installation at the Brewster triple superphosphate

Top: Chain Mills, regarded as the world's largest, form heart of a new pollution control system of American Cyanamid Company's Brewster Plant. Triple Superphosphate Manager C. L. Eisenhart makes minor operating adjustment on one of the two mills which break up green triple superphosphate to allow entrapped fluorine to be drawn off to scrubbers.

Center: Dwarfed by pollution control, an operator checks process. At right is drum which triple super is tumbled to liberate gaseous fluorides, after having passed through chain mill. Big pipe at left is plastic duct through which fluorides are drawn into scrubbers for capture.

Below: This giant structure represents an investment of more than $500,000 to reduce fluorine emission from the superphosphate curing building. As result of the installation, Cyanamid officials say less than 15 one-hundredths of one percent of fluorine entering triple superphosphate plant will escape to atmosphere. Cylindrical structures in the foreground are scrubbers to capture gaseous fluorides drawn off triple super by equipment pictured above.





plant, which includes more than $2,000,000 for pollution control and the installation of two giant Sackett chain mills. A scrubber installation reduces fluorine emission from their triple superphosphate curing building to less than 15/100 of 1% escaping to the atmosphere, a reduction of more than 70%

Construction will begin soon on dust-collection facilities, to go into operation in mid-1962, which will capture about 90% of the dust now escaping to the atmosphere.

Result of three years of research and experimentation, the chain mill installation cost more than $500,000 to build, and $100,000 a year to operate.

In the new pollution control facility, the equipment tells the story: Two TVA-type 'triple' mixing cones of 50 hourly ton capacity; two setting belts, with 10-12 minutes retention time; two transfer belts, travelling at 200 feet per minute. The uncured triple super is fed into the two Sackett mills, each with 50 hourly tons capacity. Each is 8 feet in diameter and 16 feet long; inside the mills, eighty 46-pound hammers, attached to battleship anchor chains on a revolving shaft, break the triple particles to one half inch or smaller sizes. These mills are said to be the world's largest of this type.

To release the free fluorine, the triple is then tumbled in two rotating drums for three minutes, each with 50 hourly tons capacity. A fan of 35,000 cfm pulls the fluorine off and through two scrubbers in series, where it is captured by a water spray, the water from which is then discharged to the gypsum disposal pond. These scrubbers have respectively 600 and 400 gpm recirculation.

A return belt and shuttle belt then handle the triple superphosphate to its storage.

Arthur Crago, Cyanamid's manager of phosphate operations says they are now tripling their triple superphosphate operation, and that pollution controls will be built into

the new unit. He says that this is the first equipment design primarily for control of air pollution from a triple superphosphate curing building. The dust collection facilities will include an electrostatic precipitator for the drying plant and a cyclone collector for the grinding plant.

GEORGIA

Southern Nitrogen, Savannah is actively engaged in studying the possibilities of entering new fields, according to a talk by president John R. Riley before a Canadian convention of chemical men. The concern, which makes ammonia, nitric acid and ammonium nitrate solutions, is especially studying fields where their operating and sales experience can be most useful, according to Mr. Riley.

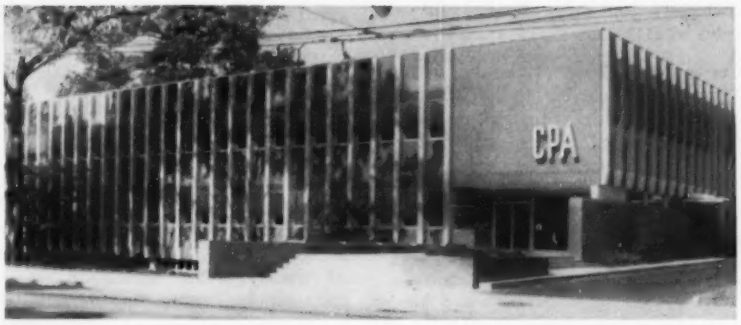
IDAHO

Bunker Hill has completed its phosphoric acid plant at Sandpoint. Now using large quantities of sulphuric from a local zinc plant, the company hopes for demand sufficient to build a companion sulphuric acid plant at the lead smelter.

IOWA

Ortho Division (Calspray) of the California Chemical Company has officially launched construction of the $22,000,000 plant at Fort Madison, on the Mississippi River. They say this is "the largest single one-time investment ever made in any fertilizer facility anywhere" and that it will be one of the largest fertilizer production centers in the world, when completed about a year from now.

Vice president, J. Q. Cope, has announced the awarding of the contract to the Bechtel Company for the construction of its ammonia plant at Fort Madison. The ammonia plant is expected to be completed in late 1961 or early the following year. Utilizing natural gas as feed stock, this ammonia plant will produce 300 tons of liquid anhydrous ammonia per operating day.



Cotton Producers Assn. and the Cotton States Insurance Companies have moved into their new $1,000,000 three-story building at 3348 Peachtree Road, NE, in Atlanta, Georgia. Some 150,000 farmer members own the structure, according to D. W. Brooks, general manager. CPA operates fertilizer plants in Georgia and is building a plant in Alabama.

LOUISIANA

Monsanto Chemical has a process control computer running its $15,000,000 Luling ammonia plant. Where operators used to estimate instrumentation settings, the computer now figures settings for the highest ammonia output, makes the exact adjustments needed . . . and is expected to pay back its $300,000 cost in three years by boosting output 6 to 9%. This is one of the first multi-unit chemical plants to be so controlled.

The installation story dates back to 1957, when the TRW Computer Co. of Los Angeles first contacted the management and as a result a mathematical model which demonstrated that the RW-300 was best suited for the purpose. This is functioning 95% perfectly, but occasionally a problem arises that humans must correct — and they are available for the purpose.

The computer, which is needed actually only 60% of the time for the present plant, has capacity to switch over to operation of other plants, and adjacent Monsanto plants may some day also be controlled by this same unit.

The Luling plant operates around the clock, every day in the year, with 400 people—which is five more than were on the job before the computer came in. They are there to monitor the operations and to help the computer the 5% of the time it is baffled.

MISSISSIPPI

Mississippi Chemical, Yazoo City, is still trying to analyze why their 100 foot prilling tower collapsed. Meanwhile they are back in urea production. As we reported here last month, the damage is estimated at $500,000.

• • •

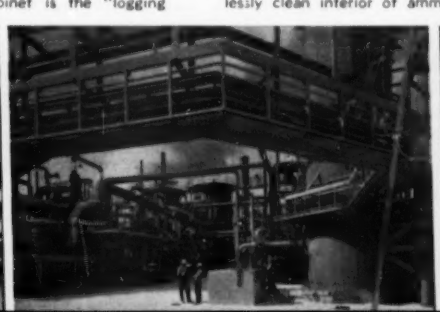
Dixie Fertilizer, Meridian, have completed and officially dedicated their $300,000 plant with 120,000 annual ton capacity of fertilizer from sludge and chemicals. They will also turn out superphosphate at about 20 hourly tons when in full production. James A. Hill, Jr. is president of the firm, which will also market bat guano (see page 41.)

MISSOURI

Solar Nitrogen, in addition to the $15,000,000 plant which last month we reported under construction, have announced a urea unit, to cost between $2,000,000 and $3,000,000, also at their Joplin facility. The plant, which is said to be the first of its kind in the US, being built under license from Stamicarbon, N. V. Construction contract has been awarded to Arthur G. McKee of Cleveland.

MONSANTO'S COMPUTER-OPERATED PLANT

Left: Operator sitting at computer control console in the master control room reads efficiency data on the processing operation as it issues from automatic typewriters linked to the complex electronic equipment. The typewriter on the table records selected signals the computer might send to various controls along the 300-yard-long process line and also any orders fed into the system by operators. The long-carriage typewriter sitting atop the console cabinet is the "logging machine" which comes to life at intervals, tapping out instantaneous reports on operating conditions along the process stream. Thus, these two typewriters automatically provide a record of the plant operation, day by day.
Center: Banks of input and output instrumentation lines are interwoven into the network of process facilities for ammonia manufacture. The computer control building is just out of sight at left.
Right: View of gas compressors used in ammonia process. Note spotlessly clean interior of ammonia manufacturing facilities.



—Around the Map . . .

Consumers Cooperative, Kansas City, which earlier this year had established four "prescription mixing" centers in Iowa, Missouri, Colorado and Nebraska, has established four more—at Eagle Grove, Lake City and Marathon, Iowa and Scottsbluff, Nebraska. An agronomist is manager of each plant and he works closely with cooperatives in his area, taking soil samples and prescribing plant food. The cooperative supplies the bulk handling for application directly to the fields.

OKLAHOMA

Nichols Seed & Fertilizer, Oklahoma City, being operated by a trustee in bankruptcy, has produced since February $312,019 from assets. After operating expenses it now has $217,530 in cash, has paid off $66,000 in secured claims — and the original bankrupting figure was $361,500. Their fertilizer granulating plant near Oklahoma City was sold to Farmers Fertilizer Co., Texarkana, Texas.

UTAH

Texas Gulf Sulphur has released data on a new $25,000,000 potash mining and processing plant at the potash reserves, option to which was granted to them by Delhi-Taylor Oil — as reported here throughout the year.

Core drilling has confirmed a potash deposit "believed to be richer than any known to exists in the US." The plant is designed to produce more than a million annual tons of muriate of potash, and should be in production about the end of 1962, with provision for expansion later that would add 50% to capacity.

Delhi-Taylor retains a net profits interest in the potash properties, and will receive advance payments of $4,500,000 over a 4½ year period—of which the first payment of $500,000 has already been received.

WEST VIRGINIA

West Virginia Pulp and Paper is investing another $700,000 in their Wellsburg plant. High speed equipment is being installed to increase production of multiwall bags and other types to offer a full line of products to meet requirements for any bags. Similar modernization has been completed, or is nearing completion, at New Orleans, St. Louis and Torrance, Cal. and an investment of more than $1,000,000 has already been made in this program.

WISCONSIN

Farmers Union Central Exchange have established at Valders a fertilizer blending plant, another of their 'soil service centers.' They have similar plants at 5 other Wisconsin points and 8 in Minnesota and South Dakota. Don Holbrook is manager of the Valders operation, where 'prescription' mixing is done after a soil specialist takes samples, which the university then analyzes. Farmers Union headquarters are at St. Paul, Minn.

BRAZIL

Fosforita Olinda, S.A., plans to expand its phosphate milling with an investment of Cr$372 million, and the production of superphosphate at a cost of Cr$550 million.

CANADA

Canadian Industries Ltd. has gone into production with its $500,000 caustic potash plant at Cornwall, first in Canada. F. M. Robertson is manager of this plant.

• • •

Brockville Chemicals Ltd. is proceeding on schedule with the $17,000,000 nitrogen plant near Maitland. Anhydrous ammonia, ammonium nitrate and nitrogen solutions are expected to be in production by next May. H. J. Baker & Bro. have established a Canadian company to handle distribution. (See Changes)

• • •

International Minerals & Chemical's president, T. M. Ware, reports satisfactory progress on the shaft sinking at the potash mine near Esterhazy, Saskatchewan, the shaft now being well into the water-bearing Blairmore sands. This is around 1,450 feet down. Potash deposits are located at 3,150 foot levels.

EIRE

Albatross-Windmill Fertiliser Co. Ltd., New Row, has awarded to John Paul and Co., Dublin, the contract to build an extension to its plant to add superphosphates to its present high analysis granular compounds production. The cost will be 500,000 pounds.

INDIA

Hindustan Chemicals & Fertilizer Ltd. is to build at Trombay, near Bombay, to cost $58,000,000, and which will be the first major fertilizer plant in India to be financed entirely by the U. S. Government from rupees owned by the U. S. Government. The four major plants will yield ammonia and nitric acid, with urea and nitrophosphate fertilizers as final products. Production is expected to be 116,000 annual tons of ammonia, 105,000 of nitric acid, 300,000 of nitrophosphate.

INDONESIA

Foster-Wheeler cancellation of the contract to build a $30,000,000 fertilizer plant in Sumatra has stirred up a hornet's nest there. Foster-Wheeler have been ready since May, 1959 to build the plant, but construction was delayed because the Indonesian Government had not completed negotiations for the training of natives to operate the plant. Meanwhile F-W had been holding open engineering staff and forces, waiting for this phase to be completed.

The reaction in Jakarta has been that if the U. S. Government does not soon supply another contractor, Indonesia is likely to cancel the loan and turn to the USSR, which has approached them in the matter. In addition, three major oil companies — two American — are threatened with cancellation of their exploitation rights.

ISRAEL

Fertilizers & Chemicals Ltd., Haifa, has made a contract with a Greek fertilizer outfit to build them a $1,000,000 ammonia storage facility. Aqua ammonia during the construction period and anhydrous ammonia afterward are part of the deal offered the Greek concern by F&C.

JAPAN

Ammonium Sulphate Exporting Co. has sustained $32,000,000 of losses due to the pressure from European suppliers, whose competition has forced the Japanese to sell ammonium sulfate below breakeven cost. An organization may be formed to control exports of the product, and there is a strong movement to cut production, substituting urea in fertilizer. Asahi Chemical is no longer producing the sulfate.

PAKISTAN

Pakistan Industrial Development Corp. plans another ammonium sulfate plant with capacity of 250,000 annual tons, to be built on the Indus River near Sukkor.

P.I.D.C. has plans for a considerable list of chemical products, agricultural or otherwise, which may prove suitable for development

around their natural gas fertilizer plant in East Pakistan.

RHODESIA

African Explosives and Chemical is planning definitely on the $25,000,000 nitrogen plant in Salisbury, Rhodesia, but it may be as much as 18 months before a start is made.

TRINIDAD

Federation Chemicals Ltd., a subsidiary of W. R. Grace & Co., is considering plans to spend some $2,000,000 on a plant to manufacture fertilizers at Port-of-Spain, according to George C. O'Farrell, general manager of their Savonetta plant. The chief drawback may be the necessity to import phosphate and potash from the US, while operating in competition with those who do not have to import raw materials.

Dutch Farmers Get Computer Help

To help them get maximum productivity from limited acreage, farmers in Holland are now receiving fertilizing advices prepared with the help of a newly-installed IBM electronic data processing system. At work in the farmer-owned, non-profit Laboratory for Soil and Crop Testing at Oosterbeek, an IBM 'Ramac' 305 composes advices based on soil analyses and data received from soil samplers (depth of sampled stratum, place of origin, etc.). Reports and advices are sent directly to the farmers, cutting two weeks from the time previously required before the system's installation.

Bemis Modernization Totals $1,200,000

A plant expansion and modernization program for Bemis Bro. Bag Company totaling more than $1,200,000 was announced by Judson Bemis, president.

Principal features of the program include a new plant near Muskegon, Mich., for the manufacture of Tekmold, and plant expansions in St. Louis, Mo., Claremont, N. H., Flemington, N. J., and Vancouver, Wash. Abount half of the total expenditures will be devoted to new papermaking and bag converting equipment installations in these locations.

The new program does not include the normal, on-going expenditures for plant and equipment modernization, Mr. Bemis said, nor does it include the company's major new bag production unit which has just been completed in the San Francisco Bay area — a 155,000-square-foot plant at Newark, Calif.

CHANGES

Brockville Names Baker

H. J. Baker & Bro. Ltd., Montreal, has been appointed distributor in Canada for the $17,000,000 nitrogen plant now being built near Maitland, Ontario, by Brockville Chemicals Ltd. H. J. Baker & Bro. of Canada is a new concern, and is under the direction of Stanley C. Millard, vice-president of the Canadian operation.

Andrew Sells to Ris-Van

James H. Andrew of Andrew Farm Store in Jefferson, Iowa, informs us he has sold his fertilizer plant and farm supply business to Ris-Van Belmond, which operates liquid fertilizer plants in Iowa and Minnesota.

Terre Co.

The new telephone number of The Terre Co., now fully moved to their new location in Totowa, N. J., is Clifford 6-5700. As we reported here last month, the mail address is Paterson 2, N. J. Their Hubbard 7-7090 phone number has been discontinued.

Dixie Buys International

Dixie Fertilizer Company, Meridian, Miss., has purchased International Guano Company and its large deposit of bat guano in caves of the Big Bend country of Southwest Texas.

The transaction, involving over $1 million according to J. A. Hill, Jr., president of Dixie, gives the company control of more than 300 million pounds of high grade bat guano found by accident last year. It will be milled in Texas and sent to the Dixie plant in Meridian for packaging and marketing. With the new contract they expect to supply some 8000 dealers nationwide, as a starter.

Bemis Acquires Systemation

Bemis Bro. Bag Company has acquired a substantial interest in The Systemation Corp., a St. Louis area firm which specializes in the development of integrated and automated packaging systems and machinery, it was announced today by F. G. Bemis, Jr., director of allied operations for his company.

Systemation creates total packaging systems and has developed advanced packaging machinery.

Harrisons & Crosfield

Harrisons & Crosfield (America) Inc. recently announced the formation of a new company—Harrisons & Crosfield (Pacific) Inc.—combining the business formerly covered by the Seattle and San Francisco offices of Harrisons & Crosfield (America) Inc. with that of Wharton Jackson Co., San Marino, Calif.

Wharton Jackson of San Marino and R. J. Davidson, Seattle, have been named vice presidents and directors of the new organization.

Royster

F. S. Royster Guano Company's Norfolk sales division, which covers portions of eastern North Carolina and eastern Virginia, will occupy new quarters this month.

K. C. Robinson, Royster's Norfolk sales division manager, announced the near-completion of a modern 1800 square foot sales office building just outside Royster's Money Point, Va. factory.

The Norfolk Sales Division has been located in the 14-story Royster Building in downtown Norfolk for nearly 50 years, along with the company home office.

Ortho Division

Charles E. Cody, western regional manager of the Ortho Division of California Chemical Co. (Calspray) has announced the appointment of American Factors, Ltd., as distributors of the Ortho line of agricultural and garden pesticides and fertilizers in Hawaii. In addition, it was announced that Pacific Chemical & Fertilizer Co. will continue as joint distributors of Ortho garden and home products in the state. Robert Uttermohlen has been named Hawaii district manager.

Central Farmers

Changes in operating responsibilities and divisional functions announced by Central Farmers Fertilizer:

All products will be handled by two commodity divisions—Nitrogen Products Division, with G. W. Bunting as vice president, Cliff Kindschi as distribution manager, and Ray Pruban as exchange coordinator; and the Phosphate and Potash Products Division with R. A. Garn as director, John Wiley as distribution manager, and William Dickey as supply manager.

W. T. Tillotson will manage the Idaho Phosphate Works.

In staff positions, L. E. Quiram has been appointed administrative assistant to the president directing planning, internal purchasing, traffic, office management and personnel. L. J. Pircon has been made research and technical director in charge of research, engineering, quality control and technical services. E. E. Rennhack has been named controller and treasurer.

INDUSTRY PEOPLE

Sohio

George L. McGuffey has been appointed sales manager of national accounts in the agricultural section of the Sohio Chemical Company of Lima, Ohio, and Harrold W. Goodnight was named district sales manager in charge of agricultural sales west of the Mississippi, according to an announcement by J. W. Bibbins, manager of agricultural sales.

McGuffy

Goodnight

Mr. McGuffey joined the chemical department in 1955 after serving in various sales capacities with a competitive nitrogen producer.

Mr. Goodnight originally joined Sohio in 1939 and has been with the Chemical Department since 1955.

Mr. Goodnight will establish an office in Kansas City, Missouri, and his efforts will be in support of the new ammonia and urea facilities now under construction at Joplin, Missouri.

Baylor

Frederick

The appointment of Cecil E. Baylor as agronomist has just been announced by H. H. Tucker, agricultural services director of Sohio. Prior to joining Sohio, Mr. Baylor served in various capacities in the fertilizer industry with Aylco Chemical Company and the Smith-Douglass Company.

Mr. Tucker stated that Mr. Baylor's experience in the agronomy of both dry and liquid fertilizers will afford assistance to customers in the fertilizer industry.

Mr. Tucker has also announced the appointment of John C. Frederick as technical service representative. He will be responsible for assisting Sohio Chemical Company's customers in technical service aspects of fertilizer manufacture.

Prior to joining Sohio, Mr. Frederick served as assistant superintendent of Davison Chemical's Joplin, Missouri plant. He will augment agricultural service activities in the field of granulation and pre-neutralization in fertilizer manufacture.

Sulphur Institute

The Sulphur Institute has announced appointment of Dr. Rene Leclercq as vice president. He has been serving as research director for Union Chimique Belge in Belgium since 1956. The announcement was made by Dr. Russell Coleman, president of the new international research organization.

Leclercq

Rucker

Dr. Leclercq will be in charge of the European Office of the Institute, located in London. He will be responsible for the Institute's program of research and education dealing with the uses of sulphur in all its forms in Europe. The program will be developed in cooperation with private and public research and educational agencies in Europe.

The appointment of Delbert L. Rucker as director of information for the Institute was also announced by Dr. Coleman. He will be responsible for all of the Institute's public and industrial information programs.

Mr. Rucker has been serving as director of publications and visual services for the National Plant Food Institute since its formation in 1955. He has been editor of PLANT FOOD REVIEW, the NFI-sponsored magazine for professional agricultural workers, and has supervised the preparation and distribution of all NPFI publications, moving pictures, visuals and other educational materials.

IMC

International Minerals & Chemical Corporation has promoted James R. Archer to quality control manager of the plant food division, responsible for the quality control of all products of the division and for

Archer

Lemon

the operation of the laboratory at East Point, Ga., according to John D. Zigler, vice president in charge of the plant food division.

Mr. Archer formerly was chief chemist of the division. His responsibilities are being broadened, Mr. Zigler said, to keep pace with the rapid growth of plant food sales.

Mr. Archer joined IMC in 1934. He subsequently was assistant chemist, chemist and finally chief chemist at the Wales, Tennessee, plant. Transferred to the East Point laboratory in 1942, he was promoted to chief chemist in 1950.

Tunstall I. Lemon has joined IMC as manager-freight for the Overseas Operations division, with responsibility for arranging shipping and chartering for overseas markets for IMC's agricultural and industrial chemicals products.

Mr. Lemon had been manager of chartering in New York City for Lykes Brothers Steamship Company, Inc. He was with Lykes for seven years.

Royster

Robert P. Mason of Urbana, Ill. has been appointed sales representative in eastern Illinois for F. S. Royster Guano Co., Norfolk, succeeding Harold Silver. He will work out of Royster's Indianapolis sales office.

Ronald S. Buhr is now sales representative in northeastern Iowa, working out of Royster's Madison, Wis. sales office.

F. S. Royster Guano Co., Norfolk, has appointed James T. Via, Suffolk, Va., is now sales representative in its local Norfolk territory, succeeding C. V. Walker.

Commercial Solvents

A. W. Kinnard III has been appointed manager for the south central district of the agricultural chemicals department of Commercial Solvents Corporation, it was announced by Loy A. Everett, sales manager. He will make his headquarters in Shreveport, Louisiana, where the company has opened a new office at 418 Market

Kinnard

Dozier

Street. Fertilizer manufacturers in the states of Louisiana, Arkansas, Mississippi, Texas, Oklahoma, New Mexico and Arizona, are included in this district. No change is being made in the salesmen serving this area: D. M. Waller, Monroe, La.; W. M. Hemeter, Hattiesburg, Miss.; and W. M. Young, Mt. Pleasant, Texas.

Mr. Kinnard has been associated with CSC for four years covering the state of Florida.

G. L. Dozier has joined CSC's agricultural chemical sales staff, according to Mr. Everett.

Mr. Dozier is assigned to the southeastern district with headquarters at the company's Atlanta office, residing in Macon, Georgia. Mr. Dozier has been associated with the fertilizer industry for the past 16 years, and prior to that was with the U. S. Department of Agriculture.

He is a past president of the Georgia Plant Food Educational Society.

Chemico

Chemical Construction Corporation has announced the election of Clark P. Lattin, Jr., as vice-president in charge of petroleum and petrochemical development, according to James H. Curtis, president. Mr. Lattin until his recent resignation had been a vice-president, member of the board of directors and member of the executive committee of Foster Wheeler Corporation.

Mississippi Federated

H. D. Bounds, a salesman for the past seven years with Meridian Fertilizer plant at Hattiesburg, Miss., has begun new duties as field representative in the fertilizer division for Mississippi Federated Cooperatives.

Potash Institute

Dr. W. K. Griffith, formerly associated with the University of Arizona and Purdue University, has joined American Potash Institute as eastern agronomist serving the states from Virginia to Maine, it was announced by Dr. H. B. Mann, president of the Institute. He will serve under Dr. R. E. Wagner, eastern director of the Institute and former head of the University of Maryland agronomy department.

Griffith

Dr. Griffith formerly served as assistant county agent in Arizona where he worked closely with pasture and range leaders in Pinal County and also headed the county staff's horticultural work.

Later at Purdue University he served as research assistant, conducting various fertilization and clipping studies on the yield, persistence, and chemical composition of orchardgrass.

American Cyanamid

Appointment of Patrick M. O'Connor as administrative assistant to the marketing director of American Cyanamid Company's Agricultural Division was announced by E. H. Smythe, division director of marketing.

Mr. O'Connor joined Cyanamid in 1952 and in 1958 became manager of budgets for the Agricultural Division.

Melvin C. Firman has been appointed assistant to the manager of research and development, agricultural division, and will report to Dr. J. T. Thurston. He replaces Dr. J. H. Ware, who was recently promoted to director of the product research laboratories.

Yale & Towne

The election of A. Clifford Thornton to the new post of vice president in charge of personnel for the Yale & Towne Manufacturing Company was announced by Gordon Patterson, president. He was formerly director of personnel and industrial relations for International Minerals and Chemical Corporation, which he joined in 1942.

N. W. Nitro

Donald C. McGorman has been appointed traffic representative for Northwest Nitro-Chemicals Ltd. in Minneapolis, Minn

Armour

Armour Agricultural Chemical Company has announced the appointment of C. M. Einhorn as new products development manager, and Guilford S. Barteaux as specialty sales manager.

The appointments, both in the company's general office in Atlanta, were announced by W. E. Shelburne, president.

Mr. Einhorn, the company's specialty products manager in Atlanta since 1955, held various administrative positions in the Chicago Heights, Ill., division, beginning in 1938, when he joined the Armour organization.

Mr. Barteaux, specialty sales supervisor for Armour Agricultural Chemical Company's Carteret, N. J., Division since 1954, was previously a specialty salesman in that division. He joined the company in 1952.

Federal Chemical

Bill B. Mainord has been appointed by Federal Chemical Company to the position of assistant sales manager of its Danville, Illinois sales division. He joined the Federal organization in April 1959.

Nitrogen Division

Paul S. Keavy has been named sales representative for the Baltimore territory of the Nitrogen Division, Allied Chemical Corp., according to Borden S. Chronister, regional sales manager.

Texaco

William P. Gee has been elected vice president and assistant to the senior vice president of Texaco Inc. M. F. Granville has been elected a vice president and will succeed Mr. Gee as head of the company's Petrochemical Department.

Dorr-Oliver

At its regular quarterly meeting, the board of directors of Dorr-Oliver Incorporated, Stamford, Connecticut, elected William L. Oliver Chairman of the board.

Mr. Oliver has been vice-chairman of the board since 1956 and also serves as general counsel for the corporation. He is a partner in the law firm of Hall, Henry, Oliver & McReavy in San Francisco.

Jefferson Lake Sulphur

George F. Kirby has been promoted to assistant to F. E. Lewis, vice-president of the domestic sales, new projects division, of Jefferson Lake Sulphur Co.

—Industry People...

Bradley & Baker

H. Clair Dyer has joined Bradley & Baker's St. Louis office as a fertilizer sales representative. Mr. Dyer, who has served the fertilizer industry in the midwest for many years, will reside in Peoria, Illinois, and will cover fertilizer manufacturers in that state.

Dyer

Monsanto

Ford Maggard has been appointed traffic manager for the newly formed agricultural chemicals division of Monsanto Chemical Co. He joined the former Lion Oil Co. in 1937. He has been traffic manager for the inorganic chemical division's nitrogen products section since 1957.

Hodag Chemical

Hodag Chemical Corporation, Skokie, Illinois, has added two to its technical staff, it was announced by Sheldon E. Kent, president of the surface active chemicals firm.

Rocco L. Russo has been named technical service manager, and will deal primarily with field problems, laboratory testing, and new product evaluation. He was formerly with Smith-Douglass Co., Inc., and Weaver Fertilizer Co., where he was chief chemist.

Harry B. Parker has been appointed technical representative to process industries in Michigan, northern Indiana and western Ohio, based in Kalamazoo, Mich.

Southern Nitrogen

Southern Nitrogen Company has announced the appointment of Roland R. Granger as sales representative for Sonico in Alabama. He will handle the sale of all the company's products in the sales territory. He will make his headquarters in Montgomery.

Granger

As assistant county agent in Tallapoosa, Geneva and Lee counties for four years, Mr. Granger has specialized in soil testing and the promotion of the Alabama Extension Service soil fertility program.

Bemis

Robert J. McDonald has been appointed assistant manager and T. I. B. Gray sales manager of the packaging service unit of Bemis Bro. Bag Company, it was announced by H. V. Howes, director of sales. The company's Packaging Service, located in Minneapolis, designs and manufactures bag filling, closing and conveying equipment, and also provides plant survey services for installation and improvement of packaging operations of customers.

McDonald

Gray

Mr. McDonald will succeed William J. Geimer as manager of the division when the latter retires next January 31.

L. A. Rowden has been named sales manager of the Omaha sales division it was announced by S. D. Robey, manager of the Omaha plant and sales division.

Rowden

Chenault

Louis W. Chenault, sales manager for the Houston sales division of Bemis, has been named manager of the company's Houston plant and sales division, it was announced by H. J. Wehrenbrecht, director of southern operations.

Robb

Rogan

He will replace Gordon M. Robb who will become manager of the Bemis plant and paper mill in Peoria, Ill. on January 31, when L. J. Finn retires after nearly a half century of service. B. E. Rogan has been named to succeed Mr. Chenault as Houston sales manager.

John Blue

William D. Tucker, connected with the John Blue Company, Inc. of Huntsville, Ala., for more than 25 years, has been elected executive vice president of the firm, according to an announcement by John Blue, chairman of the board and president.

Tucker

Blue manufactures fertilizer applicators and handling equipment.

PCA

All directors of Potash Co. of America were reelected at the recent annual meeting of stockholders. They include Eugene H. Adams, Charles Boettcher II, Stewart Cosgriff, Chris Dobbins, John W. Hall, G. R. Harris, J. Ramsay Haris, Mason A. Lewis, Donald S. Stubbs and H. C. Van Schaack, all of Denver; G. F. Coope, Blue Hill, Me., and Albert K. Mitchell, Albert, N.M.

Planters Fertilizer

Planters Fertilizer and Soybean Company, Pine Bluff, Ark., has announced appointment of Dr. Paul J. Talley as its agricultural chemicals consultant. Bill Dunklin, director of fertilizer and insecticides sales, announced the appointment.

Dr. Talley will continue ownership and management of the Seark Seed Service in Pine Bluff but will be available for consultation service with the Planters Company's customers.

Bunker Hill

William G. Hewitt, assistant to the president at Bunker Hill Company, has been named general manager of the company's Pacific operation.

The Pacific division will be an integrated operation division of the Kellogg, Idaho Company, with sales activities of the former fabricated products and chemical divisions now combined into a single sales department.

In addition to his new duties, Mr. Hewitt will continue to be responsible for sales of sulphuric and phosphoric acid produced at the company's Kellogg plant.

M. E. Elmore, sales manager of the chemical products division, has been named Pacific division sales manager, and A. F. Kroll, production manager of the fabricated products division, has been named Pa-

cific division production manager.

R. H. Cutting, vice president, will be in charge of a newly formed marketing department and S. R. Gill has been appointed manager of the marketing services.

Davison Chemical

John T. Sadler, Jr. has been promoted to director of purchases of the mixed fertilizer division, Davison Chemical Division of W. R. Grace & Co.

Mr. Sadler has been assistant director of purchases for the past three years and moved into the present position with the retirement of Edward A. McGinty.

American Factors

Two appointments have been announced by American Factors, Ltd., Honolulu. Howard Stahr has been named sales representative in the chemical, industrial and tire department. He was formerly with Pacific Chemical and Fertilizer Co., and will promote and distribute the California Chemical Corp.'s Ortho line of fertilizer and agricultural chemicals, for which Amfac is now exclusive agent in Hawaii.

David W. Pratt has been appointed staff agriculturist. He will assist George Y. Ewart, director of agriculture and hydrology.

Summers

Summers Fertilizer Company, Baltimore, Maryland, has announced that Jere G. Moynihan, general sales manager for Summers' interests in Maine and New Brunswick, has transferred his headquarters from Sandy Point, Maine to Houlton, Maine. Summers' Aroostook activities, formerly directed by F. H. Totman, will be assumed by Mr. Moynihan. Mr. Totman, with Summers since its organization in 1922, will continue as a director of the company and collaborate with Mr. Moynihan on Aroostook County potato transactions. Since 1942, Mr. Moynihan has held various positions in both the production and management of Summers' and Northern Chemical Industries' interests in Maine.

Mississippi State

The reorganization of the Division of Agriculture and the retirement of Dean Clay Lyle and Associate Dean E. B. Colmer, extended to February 1, has brought the announcement that on February 1 Dr. William A. Giles will become vice-president of agriculture and forestry. He has been in charge of the Delta station.

At the same time Dr. Louis N.

Lyle

Giles

Wise, professor of agronomy and agronomist for the AES becomes Dean of the School of Agriculture, and M. S. Shaw, Associate Director of the AES has been named Director of the Agricultural Extension Service. Harry H. Leveck, associate AES director, becomes director and Robert T. Clapp moves up from assistant to Dean of the School of Forestry.

Sharp Rise Predicted in Farm Mechanization

The next decade may see the sharpest rise in farm mechanization in American history. This was predicted by Joseph W. Haney, Goodyear's national farm tire manager.

Discussing future farm mechanization, he said the number of farms in the United States plunged from 5.6 million in 1950 to 4.5 million in 1960 and is expected to drop to 2 million by 1975, farm population, which was 25 per cent of the total U. S. population 30 years ago, is down to 10 per cent and probably will be only four per cent by 1975.

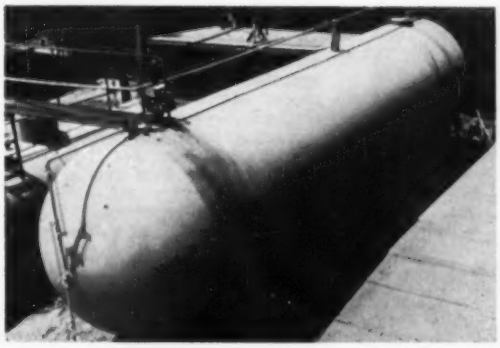
In line with this trend, he said, the average size of the American farm grew from 150 acres in 1939, to 215 acres in 1950, to 300 acres today, and is expected to be 450 acres in 1975.

"To meet the food requirements of 350 million people, we will need to more than double our production of foodstuffs within the next 40 years," he said. "If productivity per acre were to remain at today's level, accomplishing this would require the farming of an additional 500 million acres of land.

"Increased farm productivity — made possible by mechanization, technology and good soil conservation practices—is essential to America's future prosperity."

Farm Efficiency Up

A recent CFA bulletin reports the USDA has measured farm labor efficiency and finds it has increased by 84% in the past 10 years, compared with only 28% increase in American industry.



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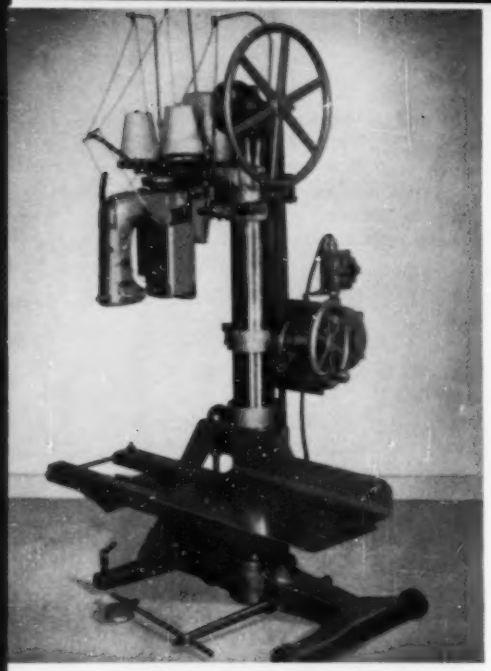


Faster Bag Closing

Higher sewing speed for closing heavy bags is now available using sewing head Style 53600 H, produced by Union Special Machine Company. This machine is fitted with sewing parts similar to the long popular Style 80600 E, but is now offered with approximately 87% higher rated speed.

Style 53600 H can be operated up to 3000 R.P.M. When run at this speed with a stitch length of 3½ per inch, the conveyor used should be synchronized to move 70 feet per minute. This sewing head is of latest enclosed design featuring automatic lubrication. It is built for closing cotton, burlap, and osnaburg textile bags, and multiwall paper bags and will handle all but extreme thicknesses. Where the additional speed causes excessive needle heating, air cooling may be used to cool the needle and prevent thread breakage.

This sewing head is suitable for mounting on various Union Special column type and table type bag closing machines, including older units that may have Class 14500 or Class 80600 heads. It has a stitch range of 3 to 5 per inch with provision for using filter cord.

For descriptive Circular 53600, circle number 1 on CF's Information Service card, page 47.

Plastic Roof Ventilators

Solid plastic roof ventilators for removing corrosive fumes have been introduced by Heil Process Equipment Corporation. Upblast discharge blows the fumes high into the air, minimizing corrosion to nearby roofs and ground areas, and reducing chances of fumes re-entering the plant. All exposed parts including the housing and impeller are built of Heil Rigidon plastic, nothing to rust. Ten standard sizes are offered, 400 C.F.M. to 15,000 C.F.M.

For Engineering Data Sheet E-7801, circle number 2 on CF's Information Service card, page 47.

Attrition Mills Catalog

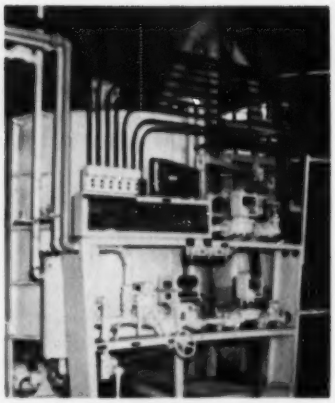
Availability of an 8-page illustrated technical catalog on Robinson single and double runner attrition mills has been announced by Young Machinery Company. Bulletin A-560-A covers motor and belt-driven double runner mills, 'Frigidisc' single runner water cooled mills, 'Attritor' pressure-fed single runner mills, as well as the complete line of 'Junior Disc' single runner mills for laboratory, pilot plant and small capacity operations.

Complete dimensions, weights and capacity specifications are given, in addition to details on feeding mechanisms, drivers, design features and specific applications. Attrition mill plates are also illustrated and described.

Young 'Robinson' attrition mills are in wide use for the reduction of chemical, food and industrial products. Copies of bulletin A-560-A available by circling number 3 on CF's Information Service card, page 47.

Nylon Spray Nozzle

A new nylon nozzle designed primarily for the application of balanced fertilizers is now being offered by Delavan Manufacturing Company. The nozzle is a deflector type nozzle and delivers a fan spray. It is available in sizes ranging from 5 GPA through 100 GPA. For complete details in catalog 2-1-9, circle number 4 on CF's Information Service card, page 47.



Liquid Fertilizer Plant

The new large-capacity 'Low-Boy' complete liquid fertilizer plant, an automatically controlled one-man unit, produces formula liquid fertilizers of pharmaceutical accuracy at low cost.

It automatically handles preweighed bulk soluble fertilizer ingredients direct to the weigh hopper. The 'Side-Winder' floor sweep screw and the cup elevators discharge the bulk ingredients to the hopper through a system of air operated gates to the reactor tanks. By the addition of an over track pan and separate screw feed to the 'Side-Winder' floor sweep screw, the bulk ingredients from hopper cars can be conveyed to the cup elevators and then through an overhead swivel bulk piling screw to storage, and through a system of air operated gates; the plant operates while cars are being unloaded.

Exact quantities of proportioned liquid ingredients are metered into the 1300 gallon stainless steel reactor tank. The separate auto-stop meters for water acid, and nitrogen materials make fast work as they discharge at the same time. The pre-weighed bulk ingredients are then discharged through the air-operated gates into the reactor tank, completing the cycle to the finished product.

'Autoformulator,' the skid-mounted 'package unit' will handle and prepare from 20 to 25 tons per hour of exactly-proportioned soluble material, depending on the formula. It is an efficient, economical and profitable one-man plant. It is factory-assembled and tested for installation in your building or in any compact frame or metal building.

Complete information can be obtained by circling number 5 on CF's Information Service card, page 47.

Kaolin Coating Agent

Roger G. Brown Company is offering a specifications and analysis sheet covering their kaolin #22 air-floated clay used in the coating of granular fertilizer mixtures and prilled materials.

Covered in full are the chemical analysis, physical constants, particle size distribution and shipping data.

For a copy of this specification and analysis sheet, circle number 6 on CF's Information Service card, page 47.

'Advanced Processing Equipment'

'Advanced Processing Equipment', the new Renneburg 16-page Bulletin G560, illustrates and describes dryers, calciners, kilns, coolers, coaters, spheroidizers, flash drying equipment, refractoryless furnaces, combustion equipment, air handling systems, air pollution control systems, cookers, digestors, granulators, mixers, pug mills, presses, extractors, counter-current washers, pilot plant units, reactors, roasters, distillation towers, and other specialized machinery.

Included are more than 75 photographs, as well as numerous drawings and diagrams.

Bulletin G560 is yours free by circling number 7 on CF's Information Service card, page 47.

Liquid Fertilizer Pumps

The Deming Company has issued a new bulletin covering their line of liquid fertilizer pumps. Described are pumps for blending, load out, nurse tank and transfer service. Full specifications are given for each pump.

For a free copy of Bulletin 850-A, Section 25, circle number 8 on CF's Information Service card, page 47.

Lab Apparatus Review

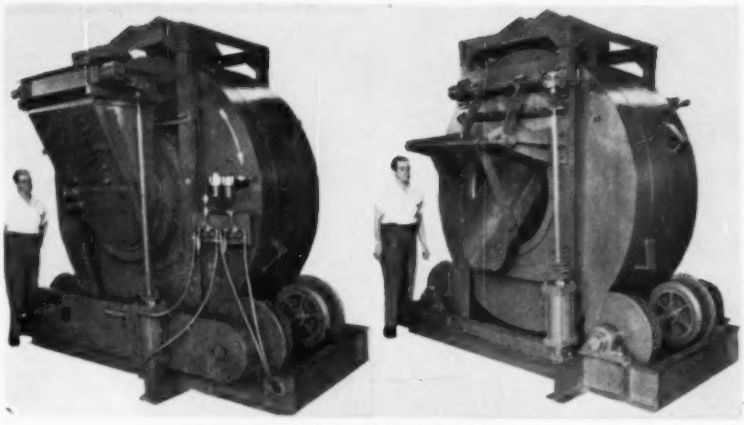
Sixteen-page LaPine Apparatus Review 12 announces many new laboratory instruments: spectrophotometers, pH meters, electrobalances, recorders, and related equipment.

In this issue Arthur S. LaPine and Company announces a new distributorship: Coleman Instruments. Several pages are devoted to Coleman Metrion pH Meters, Junior Spectrophotometers, Nitrogen Analyzers, and Autofillers.

Apparatus Review 12 offers two spectrophotometers in the visible/ultraviolet range: Bauch & Lomb Spectronic 505 Recording Spectrophotometers, and Beckman Model DB Spectrophotometers.

Many other new instruments and devices are listed. Popular items of laboratory equipment are described in detail.

For your copy, circle number 9 on CF's Information Service card, page 47.



New Rotary Batch Mixers

Stedman Foundry and Machine Company is now offering a completely new line of rotary batch mixers. Sized in 1, 1½, 2 and 3 ton batch capacity, this new line represents the culmination of more than 50 years experience in the design and fabrication of this particular type of equipment.

One of the outstanding features is that the conventional ring gear and pinion drive has been completely eliminated and replaced by a four-wheel special synthetic rubber tired trunnion arrangement for driving the shell. The four trunnions are interlocked with an intermediate chain drive, giving equal power distribution to all trunnions and assuring positive rotation. The tires, designed by the Goodyear Tire and Rubber Company, are of a special synthetic Neothane and provide positive traction with long life. The mixer can be driven with a conventional 155 RPM gearhead motor and intermediate roller chain drive.

The curved portion of the shell is constructed of ½" steel plate and is turned to true concentricity where the tires drive the shell. The straight sides of the shell are of ⅜" plate steel as are the lifting flights. Shell diameters have been increased and shell widths narrowed to provide the same high mixing efficiency found in the earlier Stedman Model K line mixers.

The "RO" line pictured is particularly designed for the use of solutions and acids now so prevalent in the industry. These models have the exterior type of discharge chute that is outside of the mixer during the mixing cycle, the discharge scoop being air cylinder operated, and a fume hood is furnished as standard equipment for dust and fume control. A special steel wheel bumper attachment is also standard equipment. An air operated intake valve is offered as an optional extra.

Shell vibration and chatter have been virtually eliminated, mixing and discharge time requirements are reduced and spare parts inventories virtually eliminated.

A dry blending version of this new mixer, the Model "R" is also available. The "R" version has a conventional discharge scoop, discharge hood and is furnished without the bumper attachment, which is not required for dry mixing. Pneumatic controls are optional for the Model "R" and are furnished at slight additional cost. Prices of the Model "R" run approximately $1,000.00 less per size than of the Model "RO" described above.

For a free information sheet on these new mixers, circle number 10 on CF's Information Service card, page 47.

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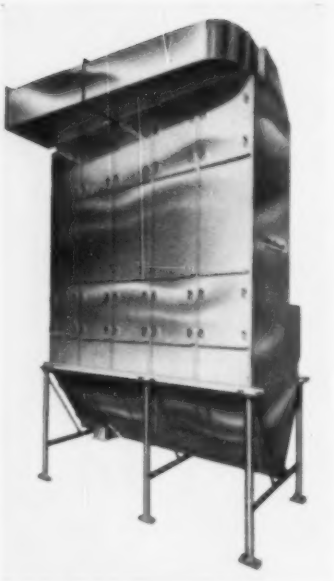


Automatic Dust Collection

A new line of automatic dust collectors, whose modular design and self-cleaning action suit them to unlimited applications, has been announced by Torit Manufacturing Co.

The new equipment, which will be sold in addition to the firm's established line of unitized dust collectors, operates at maximum efficiency without interruption due to its unique, fully automatic mechanism. The continuous operating and cleaning cycles, coupled with extremely high efficiency, make it ideal for use in plants processing chemicals.

Constructed of 3/16" polished aluminum, the Torit Automatic cleans itself three ways: periodic shaking of cloth filter tubes combined with reverse airflow through the filters, continuous removal of collected material by an adjustable screw conveyor at the base, and discharge of collected material through a rotary feed valve.

The modular sections of Torit's Automatic permit adaptation to varied dust collection and space requirements, while lightweight, but strong, aluminum construction will solve many floor load problems. Its simple design and rugged construction limit maintenance needs and assure a long life.

For further information, circle number 11 on CF's Information Service card, page 47.

Moisture Determination Balances

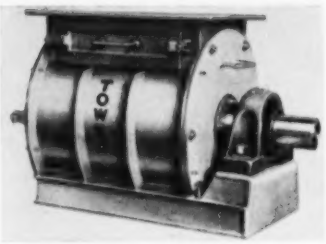
Ohaus Scale Corporation announces availability of four new Moisture Determination Balances. These four new models supplement the standard 10 gram capacity Model 6000 Moisture Determination Balance and permit the testing of samples up to 100 grams. These models now make it possible to determine the moisture content of materials where a larger sample size is desirable or where greater accuracies as high as plus or minus .01% are required. Both percentage moisture and weight of sample remaining can be read directly and continuously throughout the drying cycle.

These new models retain the features of the original Model 6000 including the magnetically damped

chain-substitution type weighing system, 650 watt infra-red heater, built-in timer and heater control, and stabilized pan for easy testing of liquid samples. Generous size aluminum foil pan liners are disposable.

All models of the Moisture Determination Balance will find wide use in laboratory and industrial testing of moisture content of a wide range of products and materials which can be tested on an Ohaus Moisture Determination Balance in a fraction of the time required by conventional procedures.

Complete specifications are available by circling number 12 on CF's Information Service card, page 47.



New Dry Feeders

A new series of pre-engineered dry feeders are now available from Tower Iron Works. Designed primarily for uniform flow of pulverized, powder or granular dry materials, in the fertilizer, chemical, or other fields, new Dry Feeders feature reinforced machined casings, corrosion resistant linings, and a channel base that takes the motor load off the feeder casing.

For further information circle number 13 on CF's Information Service card, page 47.

Diaphragm Relief Valve

A super sensitive Diaphragm Relief Valve for service where corrosive chemicals are a problem is now available from Farris Engineering Corporation.

The Farris 1000 Series Diaphragm Relief Valve provides a vapor tight seal to prevent leakage and eliminate waste. The valve's spring and guides are isolated from the process fluid to avoid corrosion problems.

Available in a wide choice of materials which include: Type 316 Stainless Steel, Bronze and Hastelloy "C" for valve body; Neoprene, Molded Kel-F or Stainless Steel for Diaphragm and Disc. Sizes include ½," ¾", 1", 1½", and 2." Gap construction includes plain, packed and open level types. Connections are screwed or flanged. It may be mounted in horizontal or vertical position.

For complete information, circle number 14 on CF's Information Service card, page 47.

Loading Valves

Eleven improvements have recently been made in the #417 and #418 Loading Valves from OPW-Jordan. As redesigned, the Loading Valves have kept pace with the trend toward higher flows and pressures in modern bulk loading practices. The improved #417 and #418 are capable of handling virtually all severe services. Stronger metals, even closer tolerances, micro-boring, 'beefed up' components, heavier springs and refined tooling and manufacturing methods have been combined to handle today's greater line shocks and higher pressures. Every #417 and #418 is rigorously tested for leakage, closing rate and shock control. For even greater strength, the 3" #417 and #418 are now available in Ductile Iron as well as Aluminum and Bronze.

Details of all improvements, features, cut sections and engineering information are available in free Bulletins F-49 and SRBc 61-60. For a copy, circle number 15 on CF's Information Service card, page 47.

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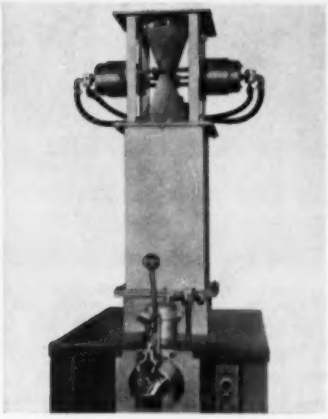


'Air-Push' Packer Hopper

A new air-push hopper has been designed as an accessory to the Coddington Air-Pac valve bag packer. It provides a positive flow of granular as well as powdered materials through the packer by retaining a continuous air pressure in the new hopper chamber which receives material from an overhead bin or supply hopper. Its size is determined by the amount of material required to fill a single bag.

When the air-push hopper is filled, the valve at the top of the chamber closes automatically as the operator pushes the starting button on the Air-Pac. Compressed air is injected into the material and the valve connected to the packing spout is opened. The material is forced to flow through the packing spout into the bag. When the correct weight is in the bag, the scale automatically stops the flow of material, the injection of air is stopped and the valve on the Air-Push Hopper is opened so that it can be recharged with material from the overhead supply while the operator is removing the filled bag.

The Air-Push Hopper eliminates the excessive pressure of several hundred pounds of material in the overhead bin which often makes it dificult to move certain materials which do not fluidize effectively even when air pressure is applied. The new unit insures free movement of a far wider range of materials of varying mesh sizes through the Air-Pac valve bag packer.

Full particulars on the Air-Pac valve bag packer and this new accessory can be obtained by circling number 16 on CF's Information Service card, page 47.

Rotary Bin Activator

A rotary bin activator that applies vibrating motion directly to the material and not to the bin walls containing them, has been announced by Vibra Screw Feeders, Inc. Hermetically sealed and requiring no maintenance, it is applicable for any bin regardless of size, shape, or material of construction, is especially adaptable for materials normally difficult to move.

Totally enclosed and noiseless, the Bin Activator may be moved vertically during operation to activate material throughout the bin, regardless of its length, so that vibrating impulses may reach all parts of the bin interior. Manufacturer claims the unit is economical to install and operate.

For detailed information, circle number 17 on CF's Information Service card, page 47.

Paper, Plastic Product Booklet

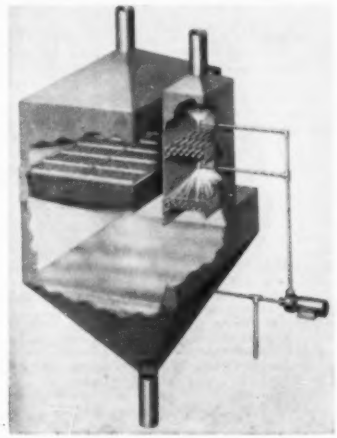
Kennedy Car Liner and Bag Company is offering the fertilizer industry a 16-page two-color booklet, 'This Is Kennedy.' The well-illustrated booklet describes the broad range of paper and plastic products which the firm fabricates.

For your copy of this informative booklet, circle number 18 on CF's Information Service card, page 47.

New Air Scrubber

A newly designed air scrubbing system may offer an economical solution to the dust collecting problems of chemical plants. Marketed as the L-S Air Scrubber by Antipol Corp., the new unit utilizes a water spray over stainless steel screening to entrap impurities. Discharged air may be recirculated in the plant or released to the atmosphere without risk of contamination.

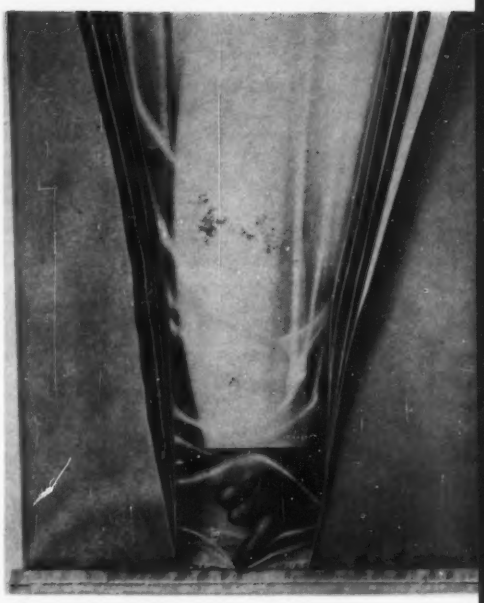
With no moving parts the scrubber is easily maintained. Pressure drop of the air entering the system is low, thus reducing power requirements. The self-cleaning design permits constant operation.



The manufacture reports that the L-S Air Scrubber was developed through an intensive research program and by the installation of large scale units in typical plants in various industries. These installations confirmed the reliability of the scrubbers, the completeness of dust recovery as high as 99% and the low water consumption of as little as I gpm per 1,000 CFM of air.

Simplicity of design keeps the installation cost of the unit low, as well as contributing to extended equipment life. The same basic design is employed in all models of the L-S Air Scrubber, with self-contained units available up to a capacity of 50,000 CFM.

For further details, circle number 19 on CF's Information Service card, page 47.



Poly-Multiwall Bag

The first practical combination of the features of an independent polyethylene tube and a multiwall paper shipping sack has been accomplished by Raymond Bag Corporation.

The new bag, designated MPS (Multiwall Perfect Seal) by Raymond, combines a complete seamless polyethylene tube as part of the multiwall, sewn and heat sealed above the sew-line to give a perfect seal. The result is the protection of polyethylene with the strength of multiwall.

The cut-away photo shows the heat sealing above the sew-line of the complete seamless polyethylene liner.

Because of its construction, the polyethylene liner cannot pull out or slip, and makes a production line package that can be filled on existing equipment. Raymond points out that this application does the same job as a self-supporting poly bag, but with less mil and more strength, to give a flexible package for the most critical requirements of storing and shipping.

The MPS bag has been succesfully used for ammonium nitrate and opens new possibilities for packaging chemicals and other difficult-to-pack-and-ship products.

For complete information, circle number 20 on CF's Information Service card, page 47.

Fluoride Scrubbing System

Alchem is offering an illustrated four-page paper on a new gas scrubber system which promises direct preparation of concentrated hydrofluosilicic acid from the effluent of phosphate fertilizer operations. In the system, a series of bulkhead stators and rotor discs make up a multi-stage scrubbing operation.

For a free copy of the paper, circle number 21 on CF's Information Service card, page 47.

unusual merchandising technique

Sell 'ENUF'

New Allied Chemical presentation helps to set the pace for an era of planned sales programs.

COMPLETE PROGRAM
Presentation begins with idea of selling a complete program of N, P and K, providing 'enuf' to supply soil needs and crop goals.

POSITIVE APPROACH
Holding a good high hand, you don't need to hesitate, bet and raise . . . with a firm, aggressive, money making sales program.

VISUAL AIDS
Can take the form of bulletin boards with frequent changes of pictures and messages, as this "Look what your neighbor is doing."

VISUAL AIDS
Can also take the form of this slide viewer, suitable for individual or small-group presentations . . . or projectors that get the message across to larger groups all at once.

DIRECT MAIL
Can multiply coverage of an area, reaching hundreds of prospects at once. Allied offers to develop letters on the dealer's stationery or their own. Or postcards such as the one pictured here.

DEMONSTRATION PLOTS
Tell the story to those 'from Missouri.' Color really shows off this plot with the thick green stand on the 'N' in the background. More than 300 farmers inspected these plots in one day this fall.

It is not always easy for a salesman to work out a good promotional program for a dealer, nor for the dealer to carry it out. But it is obvious from the record that modern selling methods are imperative if the land is to be fed as it should be . . . and that fertilizer sales are to be at the level they should reach.

Much of the pricing problem of the industry could be solved if salesmen carried a firm, aggressive money-making program to their dealers.

It is, therefore, a welcome thing that Nitrogen Division of Allied Chemical has done with its "Sell Enuf" program for salesmen to use in working with fertilizer manufacturers and dealers—one that makes it easy for both to work out a firm, money-making, sales-making operation that will register with farmers, and which quickly gets down to the farmer's favorite subject—price.

This plan, which was initially presented at the Solutions Association convention last month, is built around a series of slides in color, with high-impact captions between. Any dealer who has or can borrow a 2 x 2 slide projector, or one of the semi-automatic viewers that will handle 35mm slides, can put on the show for one big buyer or for a group assembled in his office or an auditorium, or anywhere they can be conveniently gathered.

Nitrogen Division has even gone so far as to prepare a sound tape to go along with the slides, but anyone who can read the script supplied, and present it along with the slides, can put on the show.

The presentation illustrated here, because it was prepared for liquid fertilizer mixers and dealers, is focused principally on direct-application solutions. Variations for solid or liquid mixes can be made on the same basic series. And each of these is actually a three-way program. Nitrogen Division men can use it on the desk of a dealer. The dealer can use it to train his salesmen. The salesmen can make a show out of it in his territory, to small or large audiences, as we have indicated.

To supply some idea of how this program sells, let us pick up highlights of the script used in Memphis:

"In the beginning nature made all of the nitrogen and locked it up in the atmosphere—90 million pounds over every acre, land or sea. Fifty years ago Fritz Haber found a way to fix this nitrogen for man's use.

"Man's job now is to use 'enuf'. Thousands of farmers have found that 40 pounds of actual nitrogen per acre was not 'enuf' . . . to produce the kind of crop modern farmers must have to insure their standard of living.

"The dealer's job is to sell 'enuf'. Every dealer must be honest with his customers and sell each one 'enuf' plant food to meet his crop needs for maximum yields. It is necessary to sell 'enuf' to pay all overhead costs and make a profit. If you want a dozen chicks, you gotta set at least a dozen eggs."

There followed data on N required to produce corn

"like this" (slide); cotton, tobacco and rice data were given. And a push for a complete soil test which would include nitrogen and organic matter.

There was material on deficiency symptoms, the use of tests to show where the deficiency lies. And here the story really gets down to the pocketbook nerve of the dealer and the farmer . . . and perhaps the banker and the merchant as well, if they can be exposed to it:

"What does selling 'enuf' do for you as a dealer? Each carload of N will cover about 400 acres and increase the earning capacity of each acre by about $25, or about $10,000 per carload. So when a dealer sells 100 carloads in a community, he is increasing the wealth of his clients by about a million dollars annually."

Following this the presentation at Memphis got right down to cases on how to sell, taking advantage of Nitrogen Division advertising, wall signs, direct mail, radio, TV, billboards. The main point: "Identify yourself" with the product.

Supply your salesmen with tools: soil testing equipment, a well planned sales manual including pictures of local people, local demonstration plots and the like. Give them slide viewers and material for group meetings.

Use demonstration plots for the people who are "from Missouri," and invite the farmers around you to come inspect them . . . and until the plots begin to come up, use your visual aid slides. Take pictures of your own and make them into slides. When you cannot use slides, use pictures in your manuals. A picture is worth a thousand words.

"Sell a complete program, not just phosphate or potash or nitrogen, but a balanced fertility program. Not a one-shot type of selling, but long-term satisfaction."

That is the keynote of the Nitrogen Division plan. It is a good one if it be used. And it promises a real contribution to the future of the fertilizer industry as a whole.

Pictures at Right: ——→

1. Three key figures in development of Allied's new program: Earl McNew, sales development supervisor, Garvin Matthiesen, agricultural sales manager, and Walt Colvin, agricultural sales director, displaying "Sell Enuf" poster.
2. Walter Colvin with Iowa farmer Roswell 'Bob' Garst, who hosted Nikita Khrushchev on his U. S. visit, and Howard Lathrope, field agronomist for Allied Chemical's Nitrogen Division.
3. Howard Lathrope forcefully illustrates the point that you "can't hatch a dozen chicks if you don't set at least a dozen eggs."
4. Allied Chemical personnel maning the slide film projectors include (left to right): Earl McNew, L. M. Hetler, John Thieman and Jim Rainey.
5. Borden Chronister, northeast regional sales manager for Nitrogen Division; Chick Marquiss, Marco Chemical Company, Clinton, Ill.; Clay Westcott, Holdredge Feed and Supply Company, Holdredge, Nebr.; O. C. Redenbacher of Chester Hybrid Company; Howard Lathrope (demonstrating balances); Dave Edwards, Monmouth Liquid Fertilizer Co., Monmouth, Ill.; and Bob Lemler, Alyco Chemical Company, Sullivan, Ill., listen to talk on the importance of selling a balanced program.

Pictures Below:
1. Joe Hamilton of Monmouth Liquid Fertilizer Co., Monmouth, Ill.; L. T. "Stoney" Stone, of Goodpasture Grain and Milling Co., Brownfield, Texas; Bob Garst and Howard Lathrope.
2. Looking over a graphic 'Sell Enuf' reminder are: (left to right): John Ritter, southeast regional sales manager for Allied Chemical's Nitrogen Division; Walt Colvin; and Solutions Association President Hugh S. Surles, Jr., Planters Cotton Oil and Fertilizer Co., Rocky Mount, N. C.
3. Bob Lemler of Alyco Chemical Company listens to Walt Colvin describe use of tape recording teamed with slide film presentation at Allied Chemical suite, as Garvin Matthiesen (right) looks on.
4. A shot of the interior of the Allied Chemical suite at the Solutions Convention, showing a crowd waiting for a show to begin.

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Sales Offices in: ATLANTA BIRMINGHAM DALLAS HUNTINGTON MEMPHIS NEW YORK

Formerly Industrial Division, Continental Gin Co.

—of This and That . . .

_____The legend persists that Commercial Fertilizer is a regional magazine because it's published in Atlanta, Ga. But it ain't so. Not only does Commercial Fertilizer have an exceptional following in the U. S., but foreign countries, too. Every month inquiries come in from far away places such as Milano, Italy; Transvaal, South Africa; Puerto Rico; Paris, France; Beer Sheba, Israel; Sao Paulo, Brazil; Medicine Hat, Alta, Canada; Co. Wicklow, Ireland. Just recently an inquiry came in from Robert H. Engle, who for many years, was with the National Fertilizer Association and for the past several years, has been Fertilizer Advisor to the Government of India, in New Delhi.

_____E. N. "Bert" Carvel, president Valliant Fertilizer Co., Laurel, Del., has been elected governor of his state. He previously served as Delaware's governor from 1948 to 1952, defeating Republican John Rollins. . . . P.S.—If you were watching "What's My Line" on TV Nov. 13 you were surprised and delighted to see Bert as a guest whose line the panel did not guess.

_____At the November Fertilizer Solutions meeting, program participant Roswell (Bob) Garst (who showed Nikita Khrushchev his Iowa farm on the Soviet Premier's U. S. visit last year) flayed the fertilizer industry for its failure to sell farmers on the economy of purchased nitrogen.

_____Sam L. Nevins of Little Rock, Ark., vice-president, Olin Mathieson Chemical Corp., has made three trips around the world, traveling west to Formosa, Hong Kong, Calcutta, Rome, then to London. He has been conducting feasibility studies for a large Olin-Mathieson chemical fertilizer plant in Formosa. He sees two real trouble spots in the world: Berlin and Formosa, because these two spots can give rise to all sorts of trouble, says the Western world can't afford to retreat an inch. He also deplores much of America's financial aid to foreign lands which stays under government control and never benefits free enterprise.

_____As reported by the United Press, a plan of life he designed as an Indiana farmboy led Raymond E. Umbaugh, along a path from successful farmer to scientist to corporation executive. He heads his own aircraft corporation, which has begun mass production of the Umbaugh-18, a new hybrid aircraft that takes off vertically like a helicopter, but flies like an autogyro. He formed his own agricultural chemical company which now is a multi-million dollar firm, with headquarters at Ocala, Fla. His formula for success: "Operate big and keep it simple in this forward-looking country, and you will succeed."

_____Dr. Frank W. Parker, an administrator of the crop improvement phase of the U. N. Freedom from Hunger campaign, stopped in Chicago last month, to outline the scope of the problem and enlist support of agricultural and business leaders for the program. "The current annual world consumption of plant nutrients will be taken up by Asia alone by the year 2,000," he said, "and total consumption must rise to more than 100 million tons if food supplies are to be adequate."

_____The Mississippi Aerial Applicators Association has asked for assistance from agricultural organizations. Cy Emmery of Laurel, president of the group, said 42 percent of the flying services have gone out of business in the last decade. The group passed a resolution addressed to the State Plant Board, County Farm Bureaus and other agricultural organizations and agencies, soliciting their understanding, advice and assistance in "an acute plight" of its industry.

_____Credit, fertilizer and electricity are the three "best buys" for farmers, according to Glenn E. Heitz, Washington, D. C., director of the Farm Credit Administration's cooperative bank service. In a talk made recently at Madison, Wisc., he said that a department of agriculture study shows that "for every $1,000 of working capital added by a farmer to his operation, he received a return of from $350 to $400." Recent research, he said, "shows that the last dollar's worth of fertilizer the average farmer actually used on crops and pastures returned an average of $2.93 per acre." "Farm supply cooperatives," he said, "now supply farmers with 22 percent of their fertilizer needs."

_____A new liquid plastic compound that winterizes and wraps a protective coating around shrubs and evergreens, keeping them safe from cold, burning winds and snows, during the winter months, was announced by Garden Division of FX-Lab Company. Marketed under the trade name of FX-2 Plant Protector, its manufacturers say this new product is a concentrated, non-toxic, emulsifiable, plastic compound which forms a clear glossy, flexible film on the plants, preventing loss of moisture, while still permitting the plants to breathe. The coating is thrown off as normal plant growth is resumed in the spring. FX-2 Plant Protector also is said to reduce the fire hazard of Christmas trees indoors,—a coating of this material keeps the moisture in, and because it is non-flammable, the hazard of fire is reduced.

The International Scene

F.A.O.

World needs quadrupled fertilizer

World production of primary plant nutrients will need to be raised from its present level of about 23 million metric tons to about 100 million metric tons a year by the end of the century, if world food production is to keep pace with an expanding population.

This is the view expressed by Dr. F. W. Parker, assistant director-general and head of the Technical Department of the Food and Agriculture Organization.

"Wherever we look in the less developed countries, there is evidence that the hunger chain starts with hungry plants which, in turn mean hungry animals and people," Dr. Parker said. "The level of plant nutrition, in fact, is one of the major differences in the agriculture of the developed and underdeveloped countries."

In discussing possibilities for increased use of fertilizer in less developed countries, Dr. Parker referred to FAO's fertilizer program, which will be carried out as part of the Freedom from Hunger Campaign and will be supported by the fertilizer industry of Europe, Asia and North America.

'The industry plans to contribute $2 million towards this program which will include extensive field experiments and demonstrations on farms, the development of soil testing services, national and regional fertilizer surveys and special agro-economic studies for use of farmers and industry," he said.

ALGERIA

To open up phosphate reserves

Detailed plans were announced last summer for the exploitation by open pit mining of extensive phosphate rock reserves at Djebel Onk in eastern Algeria, in view of the imminent exhaustion of the Kouif reserves. The existence of these deposits has been known since 1930, but their relative inaccessibility deterred exploitation while sources were available at Kouif. Plans call for production to begin in 1962 and

Dr. Frank W. Parker (left), assistant director general of the United Nations' Food and Agricultural Organization, Rome, discusses areas of future critical food shortages with T. M. Ware, president of International Minerals & Chemical Corporation, Skokie. Dr. Parker was guest speaker at a luncheon of agricultural business leaders in Chicago. During his U. S. tour he also visited S. L. Nevins, vice president of Olin Mathieson Chemical's Plant Food Division, who had visited with Dr. Parker in Rome earlier.

full-scale operation at 800,000 tons a year by 1964. The phosphate in the first section to be developed does not exceed 57 percent, but will be upgraded to 73 percent for marketing. The overall project also involves construction of a railroad between Tebassa and Bir El Ater (95 kilometers) and an enrichment plant and product facilities for petroleum occurring near the phosphate deposits. Total investment is estimated at $26.5 million, toward which the French Government will contribute about 44 percent. The absence of a known nearby water supply is a problem to be met.

BRITISH COMMONWEALTH

Production, use, both expand

Production and consumption of commercial fertilisers in the Commonwealth have continued to expand in recent years and the capacity for further growth in output is being created as more large, fertiliser plants are constructed in Commonwealth countries. This is shown in a study by the Commonwealth Economic Committee entitled "Fertilisers in the Commonwealth," 1950-1958.

Setting the Commonwealth in the world picture, the study draws attention to the striking rise in production and consumption in Continental Europe and Japan. Exports come mainly from Continental Europe, while Canada is the Commonwealth country with the largest export trade.

Lawes cuts prices again for 1960-61

Lawes Chemical Company Ltd. reported an excellent fiscal year at its 88th general annual meeting. This is the oldest chemical fertilizer manufacturer in the world. The Chairman, Frank A. Perkins reminded the stockholders of the expansion of advertising, sales organization, research and production, plus the reduction of selling prices to the lowest possible level, which has been reported here early in the selling season. The results, Mr. Perkins reported, has been to secure a larger number of Agricultural Merchants to handle the product; research has enabled them to make full use of the new fertilizer raw materials now available; the expanded soil advisory service is "second to none in the United Kingdom."

As a result, prices can be lowered still further for the 1960-61 season, he concluded.

EIRE

May soon export fertilizer

The Irish Republic is within sight of self-sufficiency in the production of chemical fertilizers and may have an exportable surplus fairly soon, it was stated by the Prime Minister Sean Lemass during the formal opening of a new fertilizer plant at Cork. Mr. Lemass said:

"We are now within sight of meeting all of our expanding needs for phosphatic fertilizers from home sources," he said. "Indeed the planned capacities of all the new plants may, on their completion, well bring production possibilities above present consumption levels, which reflects the confidence of the manufacturers that the increase in the utilization of chemical fertilizers recorded in recent years will be continued."

Mr. Lemass estimated the Irish demand for single superphosphate fertilizer this year at 300,000 tons, compared with a consumption of 186,000 tons in 1957-58 year and 254,000 in the 1958-59 year.

SAFETY....

FETED FOR SAFETY

Employees of the Witts Fertilizer Company of Norwich, Ontario, were recently feted for having established a safety record of 1,610 calendar days without a lost-time accident. At a dinner employees, accompanied by their wives, were presented with individual awards for their efforts in observing safety practices for more than four years. Shown above at the presentation ceremonies are Edward Pite, Margaret Butler, Sam Cree, manager; Mrs. Caroline Orth and James Rennie.

Fifty Attend Southwest Regional Safety School

About 50 supervisors from fertilizer plants in southwestern states attended the Supervisory Safety Training Course held at the Jung Hotel in New Orleans.

Conducted by the Fertilizer Section of the National Safety Council and sponsored by NPFI, the course was one of five held throughout the country.

Purpose of the New Orleans 2-day session was to instruct fertilizer industry supervisors in the latest techniques of accident prevention and training, according to Bill Creel of Raleigh, N.C., national chairman of the training project.

Leaders and instructors in the course included Mr. Creel; Ansell I. Raney, chairman of the Fertilizer Section; W. N. Cox of Georgia Institute of Technology; R. L. Beacher, Southern regional director for the NPFI; Marshall Petersen, staff representative of the Safety Council; and T. H. Browner, chemical engineer, Crude Mills, Wesson Oil and Snowdrift Co., Inc., New Orleans.

The course featured demonstrations, illustrated talks and lectures as well as the latest safety and training films.

Milton J. Hattier, insurance manager and director of safety for Wesson Oil and Snowdrift Co., was in charge of local arrangements, and Harold Haley, personnel manager for Smith-Douglass Co., Inc., in Texas City, Tex., was the school director.

Safety Section Executive Committee

The day following the meeting of the Safety Section as part of the National Safety Council convention, the executive committee of the Section met and reported on recent activities.

Among the various reports, C. S. Griffith, Virginia-Carolina Chemical Corp., chairman Membership Committee, reported the present membership at 92, with over 400 letters sent out over the year. The main project of the Fertilizer Section over the past three years has been the presentation of Fertilizer Supervisory Safety Training Schools. The last of the group of schools held Nov. 8-9 at the Jung Hotel, New Orleans, La., under direction of Harold D. Haley, Smith-Douglass Co., Texas City, Texas. By the end of the present series, over 400 supervisors will be trained. This should help to lower compensation rates in the fertilizer industry. The future of the schools will be decided upon at the next meeting of the Executive Committee.

Emerson M. Jones, Allied Chemical Corp., was appointed to serve as

Ansell I. Raney, left, the newly elected chairman Fertilizer Section, National Safety Council, presented a plaque to outgoing chairman Elmer C. Perrine, for his outstanding contributions to the success of the Fertilizer Section's activities during the past year.

chairman of the Engineering Committee, to work on technical releases on all aspects of fertilizer manufacturing and will be our outside liaison with M.C.A., N.S.C., etc.

A sub-committee composed of John Smith, Spencer Chemical Co., Elmer Perrine, Allied Chem. Co., John Mark, Farm Bureau Co-Op Association, Gaither Newnam, Smith-Douglass Co., and Marshall Peterson, N.S.C., will review the final draft of the "Fertilizer Safety Guide" booklet for possible publication about Jan. 1, by NPFI.

A new committee for off-the-job safety was appointed, consisting of James W. Smith, Western Phosphates, Inc., Grayson B. Morris, Southern States Cooperative, and Mike C. Ellison, Mississippi Chemical Co.

The next meeting of the Executive Committee of the Fertilizer Section, N.S.C., will be Feb. 9-10, in Tampa, Fla.

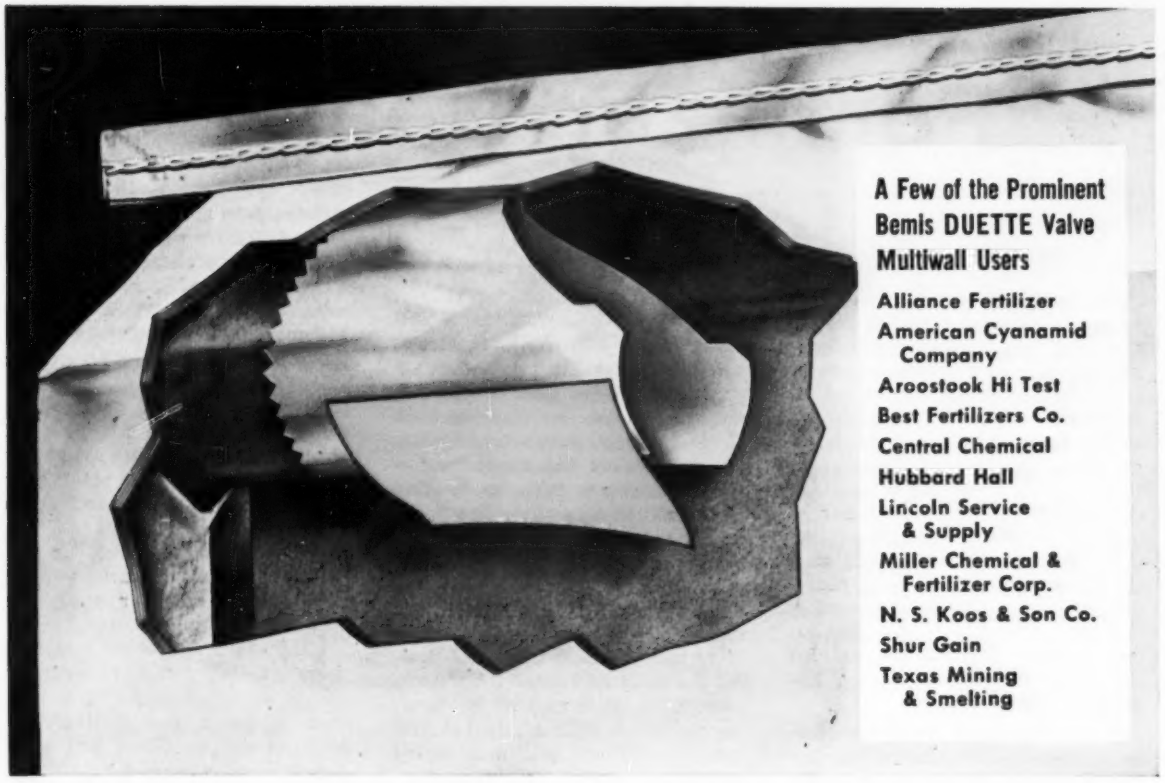
Minnesota Gets Ready for an Emergency

The Minnesota Emergency Planning Committee, which has been set up to help carry out the emergency responsibilities under the national plan of defense, has "built-in readiness" as they put it. And the USDA agencies in Minnesota have been named as members of their section of the work.

Thus, without adding personnel the major phases of agriculture are being geared for the emergency. Plans carry down to the county level, and the whole is under the supervision of the director of Foods and Materials division, Commodity Stabilization Service of USDA.

Safety doesn't cost, anything . . . UNTIL YOU FORGET IT!

Bemis *Duette*® Sewn Multiwall Sleeve Valves Have Been Experience-Proved

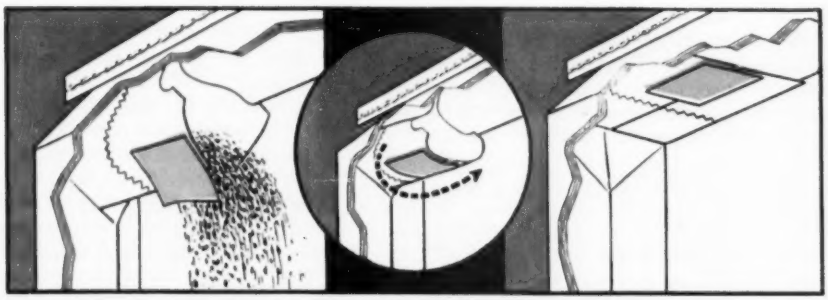


A Few of the Prominent Bemis DUETTE Valve Multiwall Users

- Alliance Fertilizer
- American Cyanamid Company
- Aroostook Hi Test
- Best Fertilizers Co.
- Central Chemical
- Hubbard Hall
- Lincoln Service & Supply
- Miller Chemical & Fertilizer Corp.
- N. S. Koos & Son Co.
- Shur Gain
- Texas Mining & Smelting

It's been more than three years since Bemis perfected the DUETTE, the multiwall bag valve-on-a-valve that gives double sift protection for granular, pelletized or pulverized products.

In that time, DUETTE Multiwalls have been used by many of the leading chemical and fertilizer manufacturers, with consistently gratifying results. The diagrammatic pictures show why . . .



WON'T CLOG . . . The Magic Yellow check flap falls freely aside from the valve slit. The sleeve won't choke or clog the packing spout.

POSITIVE CLOSING ACTION . . . This diagrammatic picture shows the action as the Magic Yellow flap starts to close over the valve slit.

CAN'T SIFT . . . When the bag is filled, the flap, acting as a check valve, completely overlaps and covers the valve slit, to stop sifting.

General Offices
408-C Pine Street
St. Louis 2
Sales Offices In Principal Cities

This is the fifth in a series of articles covering various aspects of the fertilizer dealer-farmer survey made by the authors.

Information Sources USED BY Fertilizer Dealers

by George M. Beal, Joe M. Bohlen *and* Larry Campbell

The fertilizer retail dealer appears to have a greater potential for influencing the farmer to use fertilizer at more nearly optimum levels than any single fertilizer-related information source. Whether or not the dealer does influence the farmer seems to depend largely on three factors: (1) the extent to which the farmer perceives the dealer as a reliable source of information about fertilizer and fertilizer use; (2) the extent to which the dealer attempts to fulfill this role of a reliable information source; and, (3) the dealer's ability — that is, his knowledge about fertilizer—to fulfill this role.

Despite the great amount of power the dealer holds in his hands—and the effects of this on the fertilizer industry's fate—many dealers don't seem greatly concerned about the fertilizer department of their business, in general. Only a fourth of 118 randomly selected Iowa dealers studied jointly in 1958 by the Iowa Agricultural Experiment Station and the Tennessee Valley Authority considered fertilizer to be a good money maker in itself in their businesses. Fertilizer made up an average of 14.8 percent of their total business volumes, and their fertilizer mark-ups averaged 9.3 percent as contrasted with the nearly 15 percent they averaged on other departments of their businesses.

Thus, while the fertilizer manufacturer is very dependent for his success upon the degree to which the dealer is informed about fertilizer and fertilizer merchandising techniques, he is working with dealers who, in general, seem to believe that they have no great economic incentive to gather and pass on to farmer-customers information about fertilizer and fertilizer use.

On the other hand, there is evidence from our fertilizer dealer study that some fertilizer dealers are motivated to know their product and do a good job merchandising it. There are many successful fertilizer dealers—dealers who think the fertilizer business is "excellent", think their fertilizer department is a "good money maker in itself" and that the profit margins are adequate, are maintaining relatively high mark-ups, have relatively high gross profits, and are selling a large volume of fertilizer. These successful dealers are oriented toward the importance of science in modern day farming; are more willing to adopt new sales, educational and promotional techniques; offer more basic educational services such as soil sampling, clinics and demonstrations; believe they should be a consultant to the farmer on fertilizer matters; and believe they should make fertilizer recommendations to the farmer.

If the dealer is to approach his business with attitudes and knowledge that will enable him to carry out his business operation in a successful manner he must be well informed. For instance, a specific example may be given on the relation between dealer knowledge about fertilizer and fertilizer use and the volume of fertilizer sold. The 4 percent of dealers who had the highest knowledge about fertilizer and fertilizer use had average fertilizer sales volumes of $141,365. While the 9 percent of the dealers who had the lowest knowledge had average sales volumes of $31,740.

The importance of the need for well informed dealers to help increase fertilizer sales is evident. The fertilizer industry has a major stake and responsibility in educating the dealer. The article deals with the present sources of information used by dealers, their evaluation of the information, and their desires related to additional information.

Many of the 118 dealers seemed to think their fertilizer suppliers should do a better job of keeping them informed about fertilizer and fertilizer merchandising techniques. Asked what recommendations they would make to their fertilizer suppliers—that is, what they wanted from their fertilizer suppliers—

1. 26 percent said their supplier should give them more help in keeping up to date on changes in fertilizer recommendations and products.
2. 17 percent suggested product changes or price reductions.
3. 5 percent had various other suggestions.
4. 52 percent either had no answer or said the present services were adequate.

Thus, of the 48 percent of the dealers with suggestions, more than half of these wanted their fertilizer suppliers to provide them with additional information. This would seem to be quite an important segment of the dealer population.

The dealers were asked both where they were presently obtaining their information about fertilizer and fertilizer use, and which of these information sources were most useful to them. Fertilizer com-

Data in this paper are from Iowa State University Experiment Station Project No. 1352 done in cooperation with the Agricultural Economics Branch, Division of Agricultural Relations, Tennessee Valley Authority. The project is under the co-leadership of George M. Beal and Joe M. Bohlen, professors of rural sociology, Department of Economics and Sociology, Iowa State University. Data are taken from three phases of Project No. 1352. These phases were under the supervision of assistant professor John Harp, and graduate assistants Larry Campbell and Quentin Jenkins. They were assisted by graduate assistant research team members Larry Kasperbauer, Daryl Hobbs and Richard Warren.

pany publications, as shown in Table 1, were the source most frequently mentioned by the dealers as a source of information about fertilizer and its use; fertilizer wholesale salesmen were, on the average, considered the *most useful* source of information about fertilizer.

However, it should be noted that in general dealers with higher fertilizer sales volumes and more progressive orientations toward the use of new merchandising techniques tended to depend more on relatively technical information sources such as college publications, college specialists, and technical representatives of fertilizer companies rather than on fertilizer company publications or fertilizer salesmen. The lower volume dealers, on the other hand, tended to use information sources requiring relatively little effort, such as fertilizer salesmen and mass media of various types.

The dealers were asked also if they would like to have additional information about fertilizer. Slightly over 75 percent of the dealers said they would like to have this additional information. This three-fourths of the dealers, when asked what types of additional information they wanted, said:

1. general information, 20 percent.
2. applied "how to do it" information, 17 percent.
3. results of experiments, 16 percent.
4. soil testing and soils, 11 percent.
5. product information, 10 percent.

Asked where they would prefer to get this additional information, the responses given most frequently by this three-fourths of the dealers were:

1. college and extension clinics, 19 percent.
2. college and USDA publications, 15 percent.
3. college specialists, 11 percent.
4. fertilizer company salesmen, 4 percent.
5. county extension personnel, 4 percent.
6. fertilizer manufacturers or their technical representatives, 3 percent.

In addition to information about fertilizer and fertilizer use, the dealers were asked if they desired additional information about fertilizer merchandising techniques. Three-fourths of the dealers said they wanted additional information of this type.

The dealers' present sources of information about new fertilizer merchandising techniques are shown following:

Table 1.—Information Sources Used by Dealers in Securing Information about Fertilizer and Fertilizer Use

Sources	Percent Mentioning as a source	Most Useful Rankings*
Fertilizer company publications	72.9	52
Farm magazines	72.0	64
Fertilizer salesmen	68.6	115
Fertilizer manufacturers of their technical representatives	58.5	45
Good farmers in the community	58.5	72
College and USDA publications	51.7	82
County extension personnel	41.5	47
College and extension clinics and short courses	38.1	33
Magazines for dealers only	36.4	11
Clinics and short courses sponsored by fertilizer companies	35.6	29
Iowa State College specialists	31.4	42
Radio and television	22.0	0
Own experimental work	5.9	0
Other dealers	1.7	0

*The numbers in the ranking column were arrived at in the following manner. Each dealer was asked to rank the three sources he considered most useful. Points were assigned to the rankings by scoring: first rank, 3; second rank, 2; third rank, 1.

Sources	Percent
Commercial	75
Iowa State College	2
Both (Commercial and College)	6
Self	4
None	11
No answer or unclassified response	3

Thus, it appears that at present the fertilizer dealers are obtaining the bulk of their information about new fertilizer merchandising practices from commercial sources, as would be expected.

However, when the dealers were asked where they would like to obtain information about new fertilizer sales techniques, the pattern of responses was somewhat different. These findings are shown below.

Sources	Percent
Commercial	22
Iowa State College	15
Both (Commercial and College)	14
No source specified	22
No additional information desired	25

From this list of *preferred* sources of information about new fertilizer merchandising techniques it appears that the dealers' preference for commercial sources is lower than the level at which they are currently using them. This might be interpreted as meaning that while the dealers are presently using the easily available information emanating from commercial sources, many of these dealers might prefer to obtain this type of information from other sources. However, of the 75 percent of the dealers who desire information about new and improved fertilizer sales techniques, only 15 percent specifically stated that they would like to get this information only from college sources. Thus, a total of 60 percent of the dealers studied want information about new and improved fertilizer sales techniques, and would welcome information of this type from commercial sources. The implication of this for the fertilizer manufacturer or distributor seems important.

Spencer Study Aims At Bulk Handling, Storage

A study aimed at helping fertilizer dealers determine the economics and methods of getting into bulk storage and handling of solid fertilizers is being made by Spencer Chemical Company.

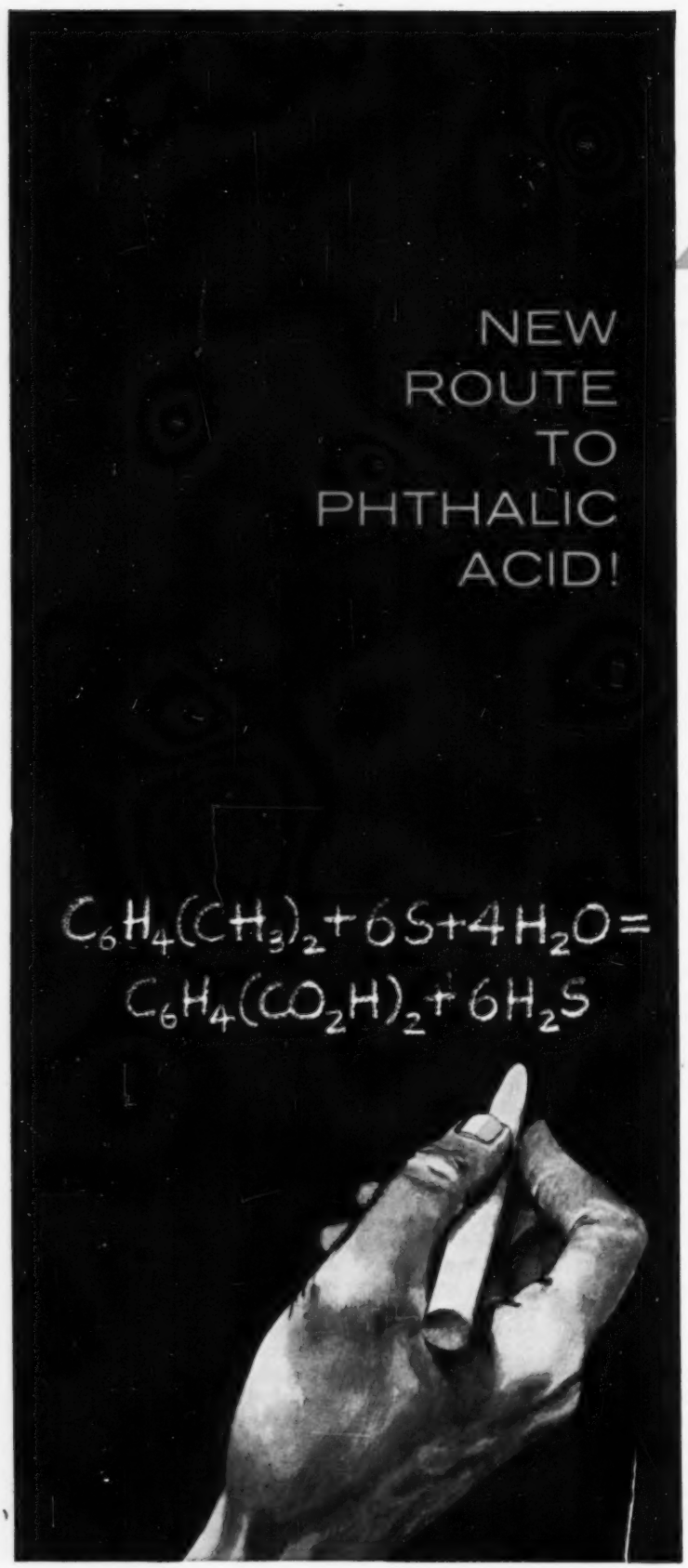
According to Dr. R. L. Balser, Spencer's product and marketing manager for solid fertilizers, "Since the shipment and application of solid fertilizers in bulk is already being widely practiced, more and more dealers are considering the addition of bulk storage and handling facilities."

Dr. Balser said that this increased interest in the possible economies of handling bulk solids prompted Spencer to set up dealer-type storage and handling facilities at Lawrence, Kansas, and Marion, Ill. Both installations are 68-ton capacity overhead "Butler" bins of a type which has already been widely adapted for handling bulk feed and grain. Using its ammonium nitrate for the tests, no major storage or handling problems have been encountered after a season's use of the Lawrence facilities.

Additional engineering work on smaller units of wooden construction is now in the planning stage. This will be used to advise dealers who are planning to construct their own bulk facilities.

Dr. Balser indicated that the dealer who is considering the addition of bulk storage and handling equipment can get a rough idea of how such equipment will fit into his existing operation by calculating on a form Spencer has devised.

While fertilizer prices have gone up only 55%, farmland has risen 140%, farm machinery costs 106% more.



SULPHUR
helps to create
headline products

In a report to the Petroleum Division of the ACS, Dr. William G. Toland of the California Research Corporation recently announced the development of a new method for producing Phthalic Acid, with the following over-all reaction:

$$C_6H_4(CH_3)_2 + 6S + 4H_2O = C_6H_4(CO_2H)_2 + 6H_2S$$

Note that the presence of Sulphur right smack in the middle of this reaction is necessary for its completion. The Sulphur leaves the process at this point. The hydrogen sulphide can be oxidized to elemental Sulphur and returned to the initial reaction. It is thus operable in a closed cycle.

According to Dr. Toland, who developed this new route to phthalic acid, the process is simple and capable of high recoveries.

Here is another good example of how strongly Sulphur is in the processing picture. Together with its many derivatives it enters into countless reactions.

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Research Results & Reports

Grace Reveals Nature of New Fertilizers

A magnesium ammonium phosphate fertilizer that will not burn or injure roots or foliage has been developed by W. R. Grace & Co.'s Research Division.

This non-burning plant food can be applied at a heavy rate. It is composed of 8% nitrogen, 40% phosphate and 24% magnesium oxide (8-40-0). Under laboratory conditions seeds germinate and plants grow in this phosphorus-containing compound without the presence of soil.

Magnesium ammonium phosphate is especially adaptable for the fertilization of tree seedlings and is recommended for use on turf, citrus fruits, shrubbery, ornamental plants and truck farm crops.

Field tests have indicated a second metal compound, ferrous ammonium phosphate (7-35-0), to be equally effective in some forestry applications. However, at this time it is primarily recommended for use in nursery beds. When required, a mixed fertilizer may be produced using this new family of fertilizers which will employ all of the essential elements needed for plant life.

Another major feature in magnesium ammonium phosphate is the controlled rate of nutrient release which allows the fertilizer to be tailor-made to meet the needs of the customer. Grace's new compound makes the essential plant nutrients slowly available over an entire growing season. Controlled nutrient release means larger and fewer applications than are usual with present commercial fertilizer applications, at a considerable saving in time and labor. This also can represent a saving in fertilizer, since less of the nutrients are leached from the soil before they can be used by the plants.

This highly efficient fertilizer will not cake and is easy to apply by hand or machine.

Currently in semi-commercial production, Grace's new magnesium ammonium phosphate is priced slightly higher than conventional field fertilizers.

Chemico's New Urea Process

Chemical Construction Corporation has announced the perfection of a new lower cost, more efficient process for the production of urea.

James H. Curtis, president of Chemico, a subsidiary of the Electric Bond and Share Company, hailed the new development as a "Significant forward step toward a solution to the problem of feeding the world."

The process employs the principle of carbamate solution re-cycle, which facilitates the complete consumption of the ammonia and carbon dioxide used as raw materials. A simpler operation that requires a minimum amount of equipment, it utilizes only a small quantity of water for the recycle of unconverted ammonia and carbon dioxide. This results in a high concentration of urea product before the evaporation stage.

Lucien Cook, chief engineer, urea division, stated that Chemico has advanced the technique which results in a marked reduction in initial investment on the part of urea producers, lower utility costs, and less maintenance costs.

The new process already has had its first practical commercial acceptance by Cooperative Farm Chemicals Association, Lawrence, Kansas.

Dow Opens New Research Center

The new Agricultural Chemical Research Center of The Dow Chemical Company has been formally opened at Midland, Mich.

The new center will house all activities related to agricultural chemicals research at Midland. The building provides more than 50,000 square feet of laboratory and office space in addition to greenhouses and service buildings. The center is located on a 110-acre farm dotted with field test plots, animal barns and corrals, an orchard, and woody plant nursery.

The new facility is a major operational unit as well as headquarters for Dow's national network of agricultural research facilities.

Research Briefs

Tradition and habit play a major part in farmers' decisions on grade and amount of fertilizer to use, the Alabama Agricultural Experiment Station found in a survey made among farmers of 16 counties in the state.

"Those who consider cost are guided in their decision primarily by cost per ton rather than cost per pound of plant nutrients," the Station says in a report of its findings. "A majority of farmers do not think in terms of how much they will get back from using additional amounts of fertilizer on a given crop.

They do not recognize the influence of changing prices received and costs on level of fertilizer use. There is a dire need for vastly better informed Alabama farmers relative to the economics of fertilizer use."

Cotton stalks, instead of being plowed back will be converted into paper and fertilizer, if the Agricultural By-Products Co., Bakersfield, Cal., investigation proves out.

Fallout taken up by plants is apparently small. The University of California Medical Center made tests on flats exposed to contamination from nuclear explosion at the Nevada test site, and found that more fission products collected in the leaves than in the seeds or edible roots.

Radiation is pretty useful in agriculture, apparently. At the Connecticut AES they are doing tricks like growing red and white carnations on the same stem. At Texas A&M they are proving out the theory we reported here several years ago in connection with the screw-worm fly whereby the male boll weevil is sterilized, so when mating season comes—no progeny appear from the mating. Peanuts are being grown that yield 10% better and are more resistant to disease . . . and so on.

Fire ants have one group that speak well of fire ants. Louisiana State fed them to bluegill and shellcrackers, and the fish did all right on

Research Briefs...

the diet. This was tried as the result of a report, which we published months ago, that heavy rains carried fire ants downstream and poisoned fish.

Erosion of banks or hillsides planted in grass lawn due to heavy rains can be stopped by spraying with latex, according to chemists of Alco Oil and Chemical Corp. The grass grows unhampered by the latex, and the erosion is resisted.

No rotation: Corn grown continuously on the same field for five years has produced just as high-profit yields as corn grown in rotation, according to University of Minnesota AES tests.

Maintenance fertilizer on established, permanent pasture is the cheapest way to increase the roughage supply for dairy cattle, reports an Arkansas farmer, who proved this out on 71 acres of poorly drained, wet land planted to fescue and ladino clover, reports Washington County associate agent Waymon Halbrook.

Salt water can be made agriculturally useful, as well as potable, by a new vapor reheat process described at a recent meeting of the American Institute of Chemical Engineers. A distilling process, it cuts cost by recycling which makes use of the condensation vapor passing countercurrent to the brine stream.

Potato yield and Nitrogen used have been studied by the University of California. "Experiments show that the first 25 pounds of N increases yields from 170 hundredweight to 265 per acre. The second 25 pounds increases yield from 265 to 301 . . . an increase of only 36 hundredweight. Each additional 25 pounds of N adds decreasing amount to the yield. So long as the added returns more than offset the added costs: fertilizer, application, harvest of the extra yield—fertilization is justified.

On the other hand, the University of Minnesota says extra-heavy doses of fertilizer may bring potato farmers bigger profit increases than ever dreamed possible. An added 500 pounds of phosphate per acre nearly doubled the yield of Pontiac potatoes in their trials. The increase paid an extra $53 per acre, with potatoes at $1 per hundred pounds. And, they continue, "contrary to some fears, fertilizer didn't harm potato quality"!

Traces of cobalt have been tagged for the first time as essential to plant growth and nutrition, University of California chemists report.

The cobalt is a key to the ability of alfalfa to draw nitrogen from the air, and to store it for deposit as an enriching agent in soil.

The discovery was announced by Dr. Clarence M. Johnson, chemist in the Department of Soils and Plant Nutrition, and Dr. Constant C. Delwiche, biochemist at UC's Kearney Foundation of Soil Science.

The UC agronomists nourished their alfalfa plants with highly purified, distilled water. They grew the plants in purified air, filtered through dacron mesh and charcoal.

Alfalfa plants grown with no trace of cobalt turned out stunted. But another group of plants, fed on water enriched with only 24 billionths of a gram of cobalt per gallon, flourished mightily. They were green, vigorous, and fixed 20 times more nitrogen than their stunted neighbors.

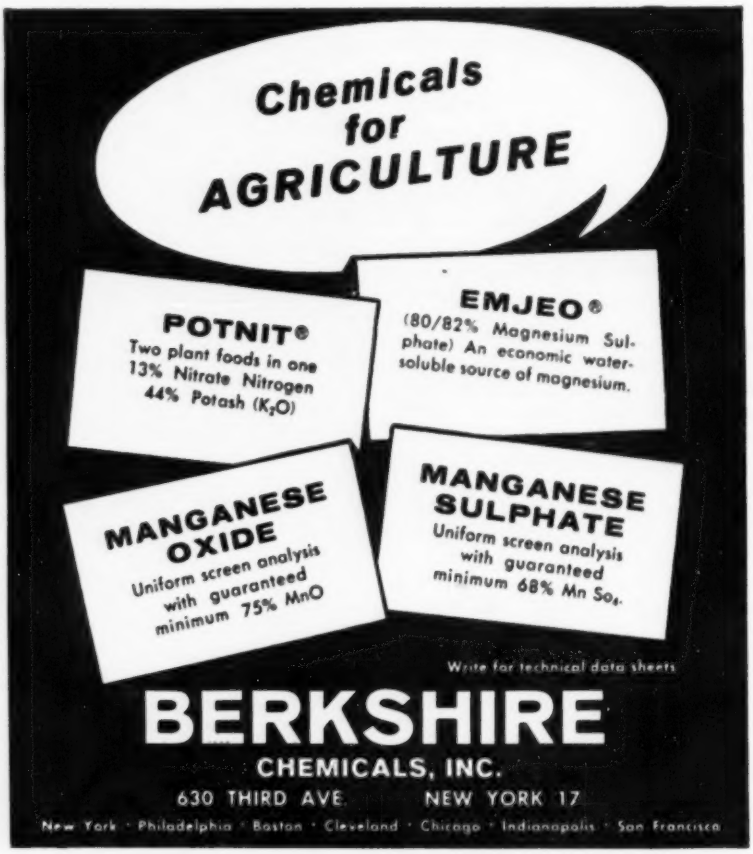
Zinc needs vary with soil types, says Dr. Leon Chesnin, Nebraska College of Agriculture. "Central and Eastern Nebraska areas need at least 10 to 20 pounds of metallic zinc per acre; studies in the Panhandle show lesser requirements." Tests indicate no zinc carry-over from one season to another.

When a greenhouse operator fertilizes plants that are not growing well, he may cause heavy damage rather than help the crop as he intends. The reason is soluble salts which accumulate in greenhouse soils when large amounts of fertilizer materials are applied repeatedly.

Thus, fertilizer applied to plants suffering from excessive soluble salts only aggravates the problem.

Researchers and many greenhouse operators have known of the dangers of over-fertilization for some time, says W. W. McCall, soil scientist at Michigan State University, but the problem is more prevalent than is generally realized.

For example, Dr. McCall says, 65 per cent of greenhouse soils tested over a year-long period by Michigan State's soil testing service contained excessive amounts of soluble salts (a "K" value of 100 or more).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HONORS

Hans Stauffer, president of Stauffer Chemical, usually on the presenting end of honors, was given the gold medal for distinguished achievements in the industry by the Society of Chemical Industry. This quote seems to us a highlight of his acceptance speech: "Never before has the opportunity been presented so directly to one segment of our industrial society, to make a real contribution to world peace. *With all due respect to the other great industries of our economy—steel, rubber, petroleum, automobiles — none of these can individually meet the basic personal needs of the millions of people in Asia, Africa and South America as effectively as we can with our chemical tools.*"

Earl H. Miller, resident manager of the United States Borax & Chemical Corporation plant in Carlsbad N. M., has been elected to the board of governors of the western division of the American Mining Congress, it is announced by Julian Conover, executive vice president of AMC. Mr. Miller joined U. S. Borax in Carlsbad in 1949.

W. R. Fort, manager of the Florida Phosphate Division of W. R. Grace & Co. Davison Chemical division, has been appointed by Gov. LeRoy Collins a member of the 10-man Florida Air Pollution Control Commission.

Mr. Fort is an industry representative on the commission, which represents all interests involved on a state-wide basis, and has broad regulatory powers. Davison operates phosphate rock and triple superphosphate processing facilities at Bartow, Fla.

Joel O. Hougen, technologist in the engineering department of Monsanto Chemical Company's Research & Engineering Division at St. Louis, will deliver the Twelfth Annual Institute Lecture of the American Institute of Chemical Engineers, December 5, at AIChE's fifty-third annual meeting in Washington, D. C.

Dr. Hougen, whose lecture will be entitled, "Process Dynamics—Accomplishments and Prospects," joined Monsanto in 1956 to carry on special research in automatic control of chemical processes.

RESEARCH GRANTS

$3,200

The National Plant Food Institute has made a $3,200 grant to the plant science section of the agronomy department at the University of Connecticut to initiate the study of forage production on dairy farms in the Northeast.

The 4-year project, which began last August on 100 test plots, includes two areas of production—grass and corn. Two perennial grasses, orchard and timothy, will be studied at six levels of nitrogen ranging from 100 to 600 pounds per acre. All rates of nitrogen will be tested on irrigated and non-irrigated plots in an effort to learn what methods will produce maximum yields.

The corn project is slated to begin next spring. Plant populations on 100 plots will range from 20,000 to 60,000.

$1,000

Two Memphis chemical companies, W. R. Grace & Co., Nitrogen Products Div., and Mid-South Chemical Corp., have made grants of $500 each to University of Arkansas, renewable annually, for fertility studies involving anhydrous ammonia.

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Chemical Week Buyers Guide Pages 173-176
Chemical Materials Catalog Pages 551-554

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A Growing Thing

Intensified Soil Fertility seems to be making big headway across these United States, as evidenced by several things. If you will recall, two meetings were held during October—one in Atlanta and one in Lima, Ohio—each bringing together agronomists from many surrounding states.

At the Atlanta meeting, ISF was credited with amazing gains in Georgia counties adopting the program. At Lima, the agronomists from Indiana, Illinois, Michigan and Ohio found themselves in veritable agreement, where wide differences were expected. Both these meetings were sponsored by NPFI, which is backing programs nationwide.

Georgia plant food consumption during the period climbed from 26% of the region total to 39% in 1959.

Iowa farmers in Des Moines County, where ISF is an accepted program, have this year broken all soil sampling records, and the soil samples ran so many that they had to be measured by the wagon loads.

Ohio's Miami County showed a 45% increase in fertilizer sales for the season ending June 30, a 19% increase over an adjoining county, used as a check.

Virginia has three ISF counties, which all three registered increases in fertilizer consumption for 1958-59 over 1957-58. Soil testing also climbed in 1959 over 1957.

These, it must be remembered, are only a few scattered returns which happened to cross the editorial desks while this issue was in preparation.

ASSOCIATION ACTIVITIES

Control Officials Publication Ready

The official publication No. 14 of the Association of American Control Officials is now available for distribution at $2 per copy through the office of the Secretary-Treasurer, Bruce D. Cloaninger, P. O. Drawer 392, Clemson, S. C. Send check or money order, or ask about discounts for lots of 100 or more. If not satisfied, money will be promptly refunded.

The publication includes a copy of the model fertilizer bill; definitions of all fertilizer terms, grouped by principal plant food ingredients; names, addresses and telephone numbers of all Fertilizer Control Officials; and complete papers of all those who appeared on the annual convention program in October.

Presidential address, "The Challenge of Change," Dr. S. B. Randle, New Brunswick, N. J.; "The Role of Fertilizer in a Changing Agriculture," Dr. Charles E. Kellogg, USDA; "Changes in Fertilizer Technology to Meet Agricultural Demands," Dr. Rodger C. Smith, Eastern States Farmers' Exchange, West Springfield, Mass.; "The Role of Soil Testing in a Changing Fertilizer and Agricultural Program," Dr. Ralph L. Wehunt, TVA, Knoxville, Tenn.; "Report of Survey on Bulk Distribution of Fertilizer," Walter D. Scholl, USDA; "Preliminary Report of Non-Farm Use of Fertilizers," A. L. Mehring, USDA; "Numerical Characterization of Fertilizer Company Records," Dr. William Duncan, University of Kentucky; "Water Soluble Manganese in Mixed Fertilizer in Florida," R. C. Crooks, Florida Department of Agriculture.

Intensified soil testing programs in the Northwest were discussed by this panel at the Pacific Northwest Plant Food Association meetings held in Boise, Idaho, November 3-4. Members of the panel were (left to right): F. Todd Tremblay, NPFI, moderator; Rex Gooch, Madison County agent, Idaho; Frank Jacobs, Jefferson County agent, Idaho; Jay Garner, Fermont County agent, Idaho; Walt Mauritson, Flathead County agent, Montana; and Charles Painter, U. of Idaho, Extension soils specialist.

Pacific N.W. Elects Rud

Pacific Northwest Plant Food Assn. elected at their Boise, Idaho Convention, early last month: Harold Rud, Simplot, president; Dick South, Hansen & Peterson, vice-president; Art Burkette, Chas. H. Lilly, treasurer.

Directors: C. L. "Swede" Cummings, Huntington-Cummings; Don Burlingham, Woodburn Feed & Supply; Ross Hansen, Phillips Petroleum; Glen Holt, U. S. Borax; Elwood Lentz, Western Phosphates.

The conference set tentative dates for Industry-Dealer meetings in Idaho, Oregon and Washington, and announced scholarships amounting to $2,593 total: $250 each to Oregon State, U. of Idaho and Washington State. Balance of original grant to Oregon Testing Tells project, $98; Southern Oregon project balance $260...; Idaho project balance $485. Washington Forage Use survey, $1,000.

Kick-off Banquets for Idaho Tri-County Intensified Programs were well attended recently when extension agents Jay Garner (Fremont County), Rex Gooch (Jefferson County), Frank Jacobs (Madison County), Charles Painter (Extension Soils Specialist), and F. Todd Tremblay (NPFI) outlined the program to community leaders. Inspecting one of the peg boards to help advertise the programs are: Warren Stensland (Cominco Products); Newell Dickson (Pacific Cooperatives); Jack Wursten, president, Eastern Idaho Plant Food Association; and James Whiteley (Balfour Guthrie).

A half a ton of soil samples, taken during Soil Fertility week in Des Moines County, Iowa, was delivered to Iowa State University for analysis at the end of September. James Hodges, county extension director, holds one of the 1,404 samples from the county. Recommendations on the soil were sent to individuals.

Industry Meeting Calendar

DATE	EVENT	LOCATION	CITY
Jan. 11-13	Agricultural Ammonia Institute	Peabody Hotel	Memphis, Tenn.
Feb. 16-17	Midwest Industry-Agronomist Meet	Edgewater Beach Hotel	Chicago, Ill.
June 27-29	Pacific N.W. Fertilizer Conference	Marion Hotel	Salem, Oreg.
July 19-21	Southwest Fertilizer Conference	Galvez Hotel	Galveston, Tex.
Nov. 8-10	Fertilizer Industry 'Round Table'	Mayflower Hotel	Washington, D. C.

Arizona Assn. Elects

Arizona Agricultural Chemical Assn. at their recent meeting elected as president Dr. Lemac Hopkins, Ortho Division; Olin Mathieson's Ed Abrahams, vice-president; Bill Finch, Pacific Guano, secretary-treasurer.

Directors, in addition to the officers named: Harvey M. Bales, Arizona Pest Control; Duncan A. Sim, Southwestern Agrichemical; M. F. Wharton, Arizona Fertilizer; J. Allen White, White Chemical.

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Two Agronomist Meetings Coming Up

December 5-8 the American Society of Agronomy, with the Soil Science Society of America, the Crop Science Society of America, and the Agronomic Education Division, will meet at the Morrison Motel, Chicago. An elaborate program is offered, a great deal of which is of direct interest to fertilizer executives and their sales organizations.

February 6-8 Southern Agronomists will be attending the Agronomy Section of the Association of Southern Agricultural Workers 1961 meeting at Mississippi State College. While headquarters will be the Heidelberg Hotel, the Agronomy section has been assigned to the King Edward Hotel, Jackson, Miss.

S.C. Fertilizer Meeting Set for January 12

Bruce D. Cloaninger, director, Clemson College, S. C. has announced the date of the 1961 Clemson Fertilizer Meeting for manufacturers, dealers and salesmen. This will be held in Columbia, January 12 and the meeting will start sharp at 10:30 and end at 4:30. Cloaninger reports outstanding speakers, and expects four to five hundred attendance. The meeting will be held in the Wade Hampton Hotel.

Southern Ag Workers Meeting February 6-8

Agricultural scientists from the South will meet in Jackson, Miss. February 6-8 to discuss newest findings in agricultural subjects as they affect the region's agriculture.

Members of the sponsoring organization, Association of Southern Agricultural Workers, which is meeting for the 58th annual time, are from southern schools of agriculture, USDA and commercial organizations and firms concerned with agriculture.

Costs go down and profits go up when farmers use good management methods.

Proper fertilization is part of, and not a substitute for, good management.

Fertilizer dollars need to be backed up by investment in good management.

Jute Shortage Crisis Solution in Sight

"The increase of approximately 25% in burlap prices in the American market which has been witnessed in the last 6 months, while regrettable, is only temporary," said D.C.B. Pilkington, chairman of the Indian Jute Mills Association of Calcutta, at a recent press luncheon.

Speaking as the leader of a delegation from the Calcutta jute industry, Mr. Pilkington stated that while the price rise is a direct reflection of the short jute crop in the current season, the industry is taking all possible steps to reduce the impact of higher prices for raw jute and finished goods on its overseas buyers until the raw material squeeze can be relieved in the next crop year.

"The jute industry is seriously concerned with the reaction of overseas consumers to present market conditions," said Mr. Pilkington, and he stated that his delegation is visiting the principal burlap consuming centers in the U.S., Canada and South America, for the specific purpose of explaining the position and re-assuring consumers for the future.

In discussing the background of the recent increase in prices, Mr. Pilkington placed the blame squarely on a physical shortage of raw jute in the current season, and added that the experience of the mills in having their raw material costs skyrocket compared with a considerably smaller increase in the price of finished goods, has confronted the industry with a most difficult situation. "The greatest anxiety of the industry, however," said Mr. Pilkington, "is the long range effect which higher prices for burlap can have on its competitive position in the American market and notwithstanding the fact that the profit margin of the mills has evaporated on simultaneous business, measures have been taken to limit as far as possible the price rise in burlap and from a long term point of view, to ensure against a recurrence of the present crisis in the future." In addition, the Indian Jute Mills Association adopted a policy providing for the compulsory sealing of looms with the object of reducing the demand which had been bidding up raw jute prices. Furthermore, a quota system for the purchase of raw jute by the mills has been agreed upon in order to prevent competitive bidding for available jute supplies. These steps, Mr. Pilkington explained, are only stopgap measures taken to tide the industry over the present raw jute shortage with hope of limiting the effect on burlap prices as much as possible.

In summarizing the supply position of raw jute, he stated that local consumption and the industry, with 9% of its looms sealed, requires about 7 million bales of jute per year. Following the bumper crop of 1958-1959, raw jute prices fell to a point where the cultivator was discouraged when the time for the 1959-60 crop sowings arrived and the acreage sown was greatly reduced. This resulted in a smaller than average carry-over at the beginning of this year and when combined with the Spring drought which affected sowings for the 1960-61 crop this year, has produced the raw material squeeze that now faces the mills.

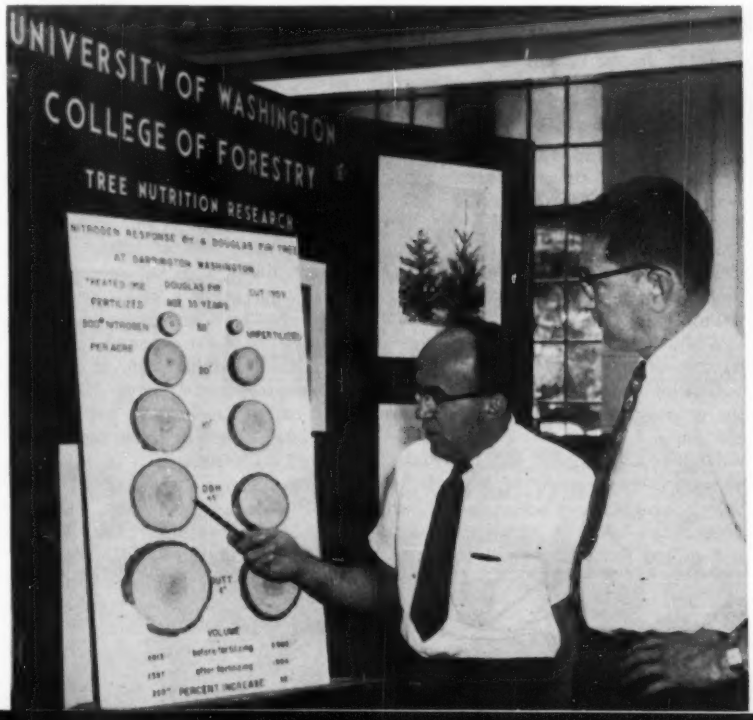
Looking beyond the present crises, he said that there is only one solution to the problem and that is to make India self-sufficient in both the quantity and quality of raw jute grown within its borders. While this is basically a government problem and particularly one at the state level, the Indian Jute Mills Association is doing its utmost to impress on all governmental bodies, the vital urgency of imparting real drive to the raw jute policy to include the provision of adequate fertilizers, the improvement of retting facilities and the spread of modern techniques in all stages of cultivation.

The industry is determined to do its part to foster more stable conditions in the future and has agreed with the Government of India that in the event of a bumper crop, it will sponsor a buffer stock program under which members will purchase agreed quantities of jute over and above their current requirements at prices to be agreed upon. This should give encouragement to cultivators and at the same time provide the mills with a raw material reserve with which to protect their future position.

Mr. Pilkington emphasized the attitude of the The Calcutta industry in the present crises is under no illusion about the seriousness of the impact of present market conditions on American burlap consumers and stated that it would be suicidal to ignore the welfare of a market that consumes 50% of Calcutta's annual burlap production and in turn produces 40% of India's dollar earnings.

FERTILIZED TREES PAY OFF

Dr. S. P. Gessel, University of Washington Department of Forestry, points out to F. Todd Tremblay, NPFI, how fertilizer applications increased wood production of Douglas fir trees grown at Darrington, Washington. The growth of fertilized trees was approximately 130 percent greater than that of the unfertilized trees. The display below was part of a room full of striking illustrations showing the need of adequate nutrition to produce maximum tree growth. The display was set up for the Fifth World Forestry Congress held in Seattle recently.



CF Staff-Tabulated TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by Cooperating State Control Officials and Tabulated by COMMERCIAL FERTILIZER Staff

	October		September		July-Sept. Quarter		January-June		July-December		YEAR (July-June)	
STATE	1960	1959	1960	1959	1960	1959	1960	1959	1959	1958	1959-60	1958-59
Alabama	-------	38,714*	39,323	43,284	79,756	91,258	869,240	846,309	180,959	199,250	1,050,199	1,045,560
Arkansas	10,401	8,516	13,380	15,112	42,604	41,802	303,835	289,363	58,713	63,767	362,548	353,130
Georgia	43,181	53,112	22,969	22,833	131,927	135,678	1,102,220	1,130,998	299,194	294,751	1,401,414	1,425,749
Kentucky	-------	27,204*	22,752	25,432	47,781	49,489	461,786	483,820	108,734	99,460	570,520	591,380
Louisiana	21,568	13,982	12,999	12,878	33,884	25,276	224,087	201,642	66,744	64,152	290,821	265,794
Mississippi	34,718	26,436	43,921	34,398	80,325	75,505	547,221	516,917	142,576	176,371	689,797	693,288
Missouri	-------	66,272*	83,871	69,282	151,075	147,812	524,336	563,055	277,708	370,036	802,044	933,090
N. Carolina	-------	31,235*	40,007	34,806	71,020	60,446	1,381,263	1,468,704	175,533	228,055	1,556,796	1,696,759
Oklahoma	-------	20,242*	38,198	29,519	61,396	45,939	72,246	64,738	72,511	68,848	144,757	133,586
S. Carolina	27,650	13,232	21,039	22,994	46,364	47,443	678,986	756,100	104,903	134,202	783,889	890,302
Tennessee	26,203	20,472	38,701	36,721	83,583	78,916	480,429	443,602	117,275	127,116	607,727	570,718
Texas	54,153	53,074	57,509	52,426	124,709	115,509	474,627	441,851	233,410	222,800	708,037	664,651
California		(reports compiled quarterly)			-------	204,000*	813,116	803,261	465,495	459,735	1,278,611	1,262,996
Virginia		(reports compiled quarterly)			74,530	68,631	591,113	618,965	141,177	160,178	732,290	779,143
Indiana			(reports compiled semi-annually)				828,164	856,316	321,956	316,341	1,150,120	1,172,657
New Hampshire			(reports compiled semi-annually)				14,488	16,143	3,694	4,746	18,182	20,889
TOTAL	217,874	188,824	434,669	399,685	1,028,952	983,204	9,367,157	9,513,181	2,770,582	2,989,808	12,147,752	12,499,692

------- (not yet reported) * Omitted from column total to allow comparison with same period of current year.

Smith Predicts Climb in Kansas Fertilizer Sales

Rapid expansion in the next 10 years could push the fertilizer industry in Kansas to $35,000,000 annual sales. This is the prediction of Floyd W. Smith, professor of soil fertility at Kansas State University, Manhattan.

Writing in the October issue of the Kansas Agricultural Situation, Dr. Smith states: "Between now and 1970, we can expect changes in the understanding of plant nutrient needs, modifications of cropping systems, improvement of farm machinery, alteration of tillage practices, and general changes in the agricultural economy. All of these will affect soil management.

"By 1970, Kansas farmers may well use 500,000 tons of commercial fertilizers containing some 200,000 tons of plant nutrients each year. Today we use 300,000 tons of material carrying 120,000 tons of nutrients."

While Dr. Smith expects increased use of nitrogen, phosphate and potash, it's nitrogen that will show the greatest gains in his opinion. He continues:

"Phosphate needs will increase as soils become more depleted with heavy cropping. Concentration of phosphate—both in straight goods and mixed fertilizers—will continue to rise. Grades such as 16-48-0 will gain popularity; those such as 16-20-0 will fade rapidly.

Potash needs, though small when compared with nitrogen or phosphate, will be better understood 10 years from now. Trace and secondary plant nutrient elements may well receive more attention.

Potash Institute Offers Vital Folder

American Potash Institute offers a folder on Forage Fertilization which is a vital subject to all of us. With a billion acres of grassland in the U.S. alone—over half the total acreage of the nation—you can see how it concerns most fertilizer makers and dealers.

Less than 10% of forage acres in many states receive any fertilizer at all, and only a small percentage get recommended treatment as far as fertilizer is concerned.

"Forage Fertilization" is offered—100 copies free. Above 100 copies, cost of production—$1 per 100; $10 per 1000. They will be very useful to you for distribution to customers, at meetings, exhibits etc. Take a look. Ask for your first free copy from the Institute, 1102 16th St. N.W., Washington 6, DC.

BOOKS

McVickar Writes on Fertilizer Use

To be on sale the 3rd of next month is a new edition of a book by Malcolm H. McVickar which was first published nine years ago. Since that time there have been many advances in fertilizer technology, manufacturing and application — and there is a crying need for this process to go much further, with our population explosion facing us.

So Dr. McVickar's new "Using Commercial Fertilizers" is a must on the bookshelf of every manufacturer, salesmen . . . and the more intelligent of the agribusiness farmers. $4.75 per copy; 285 pages Interstate Printers and Publishers, Jackson at Van Buren, Danville, Ill.

NPFI Offers Book Bargains

"Hunger Signs in Crops" and "The Care and Feeding of Garden Plants," both NPFI publications, are offered now for sale at $1.50 and $1 per copy respectively. These prices are the same to everyone — members, book dealers and the public—and are offered in order to reduce NPFI's stock. Copies may be obtained by writing National Plant Food Institute, 1700 K St., N.W., Washington 6, D. C.

new sales idea:

'Soil Fertility Sweepstakes' Promote Fertilizer Planning

Thousands of farmers will 'sign the pledge' this winter if Spencer Chemical Company has anything to do about it. For the farmer, the pledge is a simple one—to consult his fertilizer dealer for advice in planning a profitable fertilizer program. Spencer hopes to be responsible both for producing greater interest in the use of fertilizer and in promoting more dealer-farmer contact.

To encourage farmers to sign this "profit pledge," Spencer is sponsoring what it calls a "Soil Fertility Sweepstakes." The farmer's signed pledge card mailed to Spencer enters him in a sweepstakes drawing which has as its top prize all the fertilizer his land can profitably use in 1961.

The winner will have his plant food needs analyzed by professional agronomists and will receive his total requirements in any form he specifies, up to a value of $2,500. Spencer estimates that this prize can actually be worth up to $12,500 since it says crop records show that a dollar invested in fertilizer can return from $3-5 in extra profit. Another $2,500 in fertilizer will go in $100 prizes to the next 25 names drawn.

Spencer is currently putting the "profit pledge cards" on dealer counters and will officially open its sweepstakes in January with 2-page advertisements in major farm magazines. The pledge card, which will also appear in the advertisements, reads: "Having read the information on these pages, I hereby pledge to consult with my fertilizer dealer to seek his expert advice in planning the most profitable fertilizer program for my farm this year."

Spencer hopes through this dramatization to create a new awareness of the profits farmers can gain by using recommended amounts of fertilizer.

Only farmers and farm operators are eligible for this unique plant food promotion which closes at midnight on February 15, 1961.

classified advertising

RATES: 50 cents a line for **Situations Wanted** ads; $1.00 a line for **Help Wanted** ads; $2.00 a line for all other classified advertising. Word count runs approximately eight words per line. Copy should be received by 15th of month preceding publication. **Display Classified Advertising** $15.00 an inch; minimum space one inch.

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4 — Nordyke 10 x 36 roller mills, 2-roll
1 — Stedman 36" dia. 3-row cage mill
1 — Jay Bee #4D hammermill, 75 HP
4 — Davenport #2A dewatering presses
12 — Buflovak 42" x 120" dbl. drum dryers
3 — Shriver 48" C. I. filter presses, 50 ch.
2 — Wallace & Tierman bulk flow grain scales
2 — Allis-Chalmers Inter-plane grinders
8 — Allis-Chalmers degerminators

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1 — Raymond 50" 5-roller hi-side mill, rebuilt
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1 — Louisville 7' x 70' rot. cooler, 1/2" welded
2 — Bonnet 7' x 60' rot. dryers, 5/8" shell
1 — Allis-Chalmers 7' x 50' rot. dryer, 5/8"
2 — Bonnet 6' x 52' rotary dryers, 5/16"
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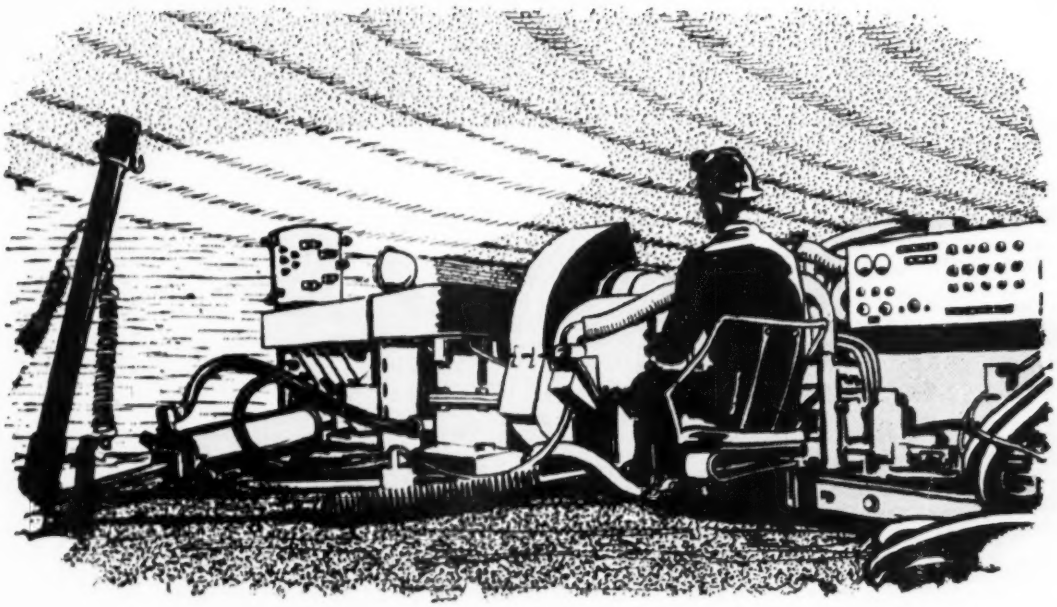

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